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CORRIGENDA.

Page 439, Line 9, from end of page, insert "Length 12 mm."

Page 450, Fig. 19, (*a*). This represents the arrangement of the spines on the brow of the propodeon in the paratype for comparison with that of the holotype shown as figure 20.

Two figures have been added in the supplementary plate which accompanies this list of corrections: No. 5*a*, and No. 12*a*. These were referred to on page 420 in the introduction, but were omitted from the paper as originally published owing to the difficulty of reproducing them on ordinary paper. The figures 2, 11, 13, and 14 are shewn again in better detail on the same plate, which should face p. 420.

Page 464, Line 20, from bottom of page for **Notogonidia,** read **Notogonidea.**

Page 465, Line 11, from bottom of page, for "....over the dorsum of the abdomen the fourth tergite" read "....over the dorsum of the abdomen reaching the fourth tergite".

Page 466, Last species but one in the Table, for **Notogonidia,** read **Notogonidea.**

Pages 480, 481, **(passim)** for **Methoca ichneumonoides,** read **Methoca ichneumonides.**

Page 486, Line 16, from end for **spiniventris,** read **langkasukae.**

Page 487, Line 24, for "wings" read "rings".

Page 488, Line 16, from bottom of page, for "been" read "seen".

Page 489, Line 20, for "scutellum metanotum and glabrous basal area," read "scutellum, metanotum and propodeon; dorsum densely and finely punctate; propodeon with a narrow glabrous basal area,"

Page 492, Line 6, from end, for **Platymopoda,** read **Platynopoda.**

FRONTISPIECE.

Mount Kinabalu British North Borneo seen from Kota Belud
Mount Nungkok stands above the Tampassuk River on the right

I. A ZOOLOGICAL EXPEDITION TO MT. KINABALU, BRITISH NORTH BORNEO (1929).

By H. M. PENDLEBURY *and* F. N. CHASEN.

(With Map and Plates I–VIII).

INTRODUCTORY.

Mount Kinabalu in North Borneo, with a summit of 13,455 feet above sea-level, has the distinction of being the highest mountain in Malaysia. Rivals on the other major land masses of the sub-region are Korinchi Peak in Sumatra, which rises to a height of 12,484 feet, and the slightly lower Sĕmĕru in Java, the summit of which is again about 12,000 feet.

Gunong Tahan, the loftiest peak in the Malay Peninsula, only attains 7,186 feet. Beyond the sub-regional boundaries to the east there are summits just exceeding 10,000 feet on the island of Bali; Lombok Peak rises to 12,470 feet and is higher than any mountain in the Celebes, Philippines, Moluccas, and eastwards, until the Snow Mountains in New Guinea with heights of about 16,000 feet, or over, are reached.

Mr. Owen Rutter has written: " Mount Kinabalu is undoubtedly the most striking physical feature of North Borneo. Standing twenty-five miles from the coast it is a landmark from afar; it rises sheer and wonderful above a thousand hills and, unlike a conical mountain like Fujiyama, on each side its pinnacles present a picture of their own. But it is from Kiau or Bundu Tuhan, the villages which nestle upon its slopes, that the mountain is most inspiring of all, looming up in its vast bulk above the lesser hills as an ocean liner above launch. Seen thus in storm, or with the morning sunshine glinting upon its waterfalls, it is no wonder that the natives of the district over which it throws its shadow hold it in veneration as the resting place of departed spirits and a dragon's home."

Mt. Kinabalu is the central area of a system of ridges, but the exact lie and even the general strike of some of these is not yet known. The mountain is usually considered as an isolated massif; broadly speaking this is, of course, true, but its exact relationship to the range of hills that stretches almost continuously through Sarawak has yet to be worked out in detail.

The peculiar mountain structure of Borneo mentioned by Posewitz, the isolated mountain ridges and mountain islands lying in hill-land, has naturally produced results in the biota of the island of great interest to the zoogeographer, and in particular the very specialized fauna of Kinabalu has long made the mountain attractive to naturalists.

Published discussions on the probable recent geographical changes in Malaysia, the origin of the fauna and the past history of the sub-region as indicated by the existing fauna, are not rare. In these, Borneo is usually prominent, the peculiar element in the fauna of the island demanding much ingenuity to explain when former land connections and submergences are being considered.

Among recent writers, Robinson and Kloss have pointed out[1] that the most dominant fact in a geo-ornithological consideration of the high mountains of Indo-Malaya, is that the peculiar elements in the fauna of Kinabalu and Borneo generally are far more differentiated than those of any other district, and that not only does Kinabalu possess several distinct *genera*, but even its Indo-Malayan *species* are far more distinct from other members of the genus than are the endemic forms of Sumatra, Java, and the Malay Peninsula, which usually stand in little more than subspecific relationship to each other: also that the very characteristic genera found on Kinabalu support the theory that in early tertiary times Borneo was of much smaller extent than is at present the case, and had a very indented coast, and much the same outline as Celebes has at present. They conclude: "It is at any rate certain that the granitic mass of Kinabalu must have been separated from the other Indo-Malayan land-masses at a period subsequent to the evolution of many existing genera, but yet at a period much more remote than the separation of Java from Sumatra by the Sunda Straits, or the Malay Peninsula from Sumatra."

The mountain was first climbed to the summit by Hugh Low in 1851. Numerous other visitors to the summit have been chronicled by J. C. Moulton,[2] and that the majority of these travellers were naturalists is only to be expected. We were in fact preceded on the mountain by several zoologists (notably J. Whitehead 1885–87; G. D. Haviland 1892; R. Hanitsch 1900; and J. C. Moulton 1913); but excluding Whitehead none seems to have accumulated large collections of animals. We who followed in Whitehead's footsteps forty-four years later have the greatest admiration for this indefatigable collector: in spite of ill-health and obstruction by troublesome natives he made the then hazardous journey to Kinabalu and only established himself on the mountain after two unsuccessful attempts. His magnificent collections in the various museums in Europe bear testimony to his doggedness and skill as a collector. To Whitehead "belongs the credit of the first extensive exploration of the mountain, and to him we owe our first real insight into its zoological treasures" (*Moulton*).

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[1] Journ. F.M.S. Mus., VIII, pt. 2, 1918, p. 98.

[2] Sarawak Mus. Journ., ii, 6, 1915, pp. 137–176. In these pages will be found a summary of the literature of the mountain up to 1915.

Yet, in spite of the exertions of the immortal Whitehead, the published results of some others who followed him made it obvious that much work still remained to be done on the mountain, especially in the invertebrate groups.

The undertaking of an extensive zoological exploration of the mountain by the Malayan Museums had been considered for some time past, but nothing constructive was done until 1928 when Mr. C. Boden Kloss (then Director of Museums, Straits Settlements and Federated Malay States,) paid a flying visit to the mountain. During this visit Mr. Kloss was able to select the best camping grounds from the collecting point of view, to enlist the whole-hearted support of the British North Borneo Company's Government, and to bring back information which proved of great value to us during our sojourn on the mountain in 1929: in particular we were able to avoid the long delays usually inevitable when dealing with native transport in Borneo.

When Kloss visited the mountain[1] he took readings (always at 4 p.m.) of a boiling point thermometer. "In the first column each height is calculated from that of the station directly below it, in the second column the height of each station is obtained by reference to sea-level at Jesselton. The third column gives the average of the two results. Compensation for temperature has been made.

	Feet.	Feet.	Feet.
Kota Belud ..	188	188	188
Kabayau ..	590	601	596
Koung ..	1,285	1,304	1,295
Dallas ..	3,126	3,153	3,140
Bundu Tuhan (Rest-house)	4,016	4,067	4,042
Kamborangah ..	7,190	7,210	7,200
Pakka ..	10,195	10,226	10,211

"The latest determined height of Kinabalu (that by Capt. Learmonth, of H. M. Survey-ship "Merlin," who spent five days observing at the summit in 1910) is 13,455 ft. (Low's Peak). Six peaks have heights of more than 13,000 feet.

"The minimum temperature during a night spent at Kamborangah was 48°F., during two nights at Pakka 42°F; at midday on the summit in beautiful weather the shade temperature was 43°F. Ice is known to form at the foot of Low's Peak. C. B. K."

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[1] *vide* Journ. F.M.S. Mus. XVI, 1931, p. 286 and map.

The following general account of our trip is written at a time when only a very small percentage of our collections has been worked out.[1] Any conclusions must therefore appear later, but the general matter and more or less detailed itinerary given herewith will if published at this stage perhaps interest the many specialists who have kindly offered their assistance in dealing with the collections.

The photographs on Plates I (*a*), II (*a*), V (*a*), VI, VII, and VIII, were taken by Mr. Kloss during his visit, and he has generously placed the negatives at our disposal for reproduction in this report. The others were taken during our visit, but the weather conditions were not always conducive to good photography.

GENERAL.

From the Government Station at Kota Belud in British North Borneo, on the Tampassuk plain, a bridle path follows the Tampassuk or Kadamaian River through open country to the Dusun village of Kiau, 3,000 feet, at the foot of Mt. Kinabalu.

In the vicinity of Kiau the country has been largely denuded of its original forest, but above the patches of native cultivation the forest is unbroken up to about 9,000 feet. Between 6,000 feet and 9,000 feet the forest assumes a mossy character, a carpet of thick, green moss covering ground and trees alike. Above 9,000 feet the character of the vegetation changes once again. The jungle is lower and this "low-sheltered forest" continues up to the tree-limit at about 10,500 feet. Above the tree limit are the bare slopes of the granite core.

A base camp was established at Kiau. The ascent to the summit was by way of the main spur running into the mountain from the south: Tenompok 4,700 feet, Lumu Lumu 5,500 feet, Kamborangah 7,200 feet, and Pakka 10,200 feet are points on this spur. After the return to Kiau, the mountain was explored from another direction and camps were established on the north-western slopes at 3,300 feet in the Kenokok Valley, and at 5,000 feet on the subsidiary Marei Parei spur.

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[1] The following reports on our insect collections from Mt. Kinabalu have been published already.

Cicindelinae, by W. Horn, Journ F.M.S. Mus., XVI, 1931, pp. 287–9.

Syrphidae, by C. H. Curran, *ibid.* pp. 339–376.

Plecoptera, *Neuroptera*, *Mecoptera* and *Trichoptera*, by Nathan Banks, *ibid.* pp. 411–429.

Carabidae, by H. E. Andrewes, *ibid.* pp. 431–485.

Cetoniinae, by G. J. Arrow, Ann. Mag. Nat. Hist. (10), ix, 1932, pp. 125–6 (new species only).

Miss L. S. Gibbs,[7] one of Kinabalu's botanical investigators, zones the mountain as follows:—

(1) *The secondary forest*, 2,500 ft.—4,000 ft.

(2) *The primary high forest*, 3,500 ft.—6,000 ft. on the main spur, and to about 5,000 ft.—5,500 ft. on lower spurs and ridges, but reaching a much higher altitude in the more sheltered valleys. Where the population is scarce, as for instance around the base of the northern ridge, the primary forest extends to a much lower level.

(3) *The mossy forest.* On some spurs of the mountain found as low as 5,000 feet. It is frequently not continuous, occurs as high as 9,000 feet, and on the Marei Parei spur loses itself on the granite core at 8,000 feet.

(4) *The scrub formation.* Found only on the disintegrating serpentine of the exposed ridges, as for instance on the Marei Parei spur at 5,000 feet—5,500 feet.

(5) *The low sheltered forest.* 9,500 feet—10,500 feet.

(6) *The sub-summit dwarf forest* } above 10,500 feet.
(7) *The granite core*

For the botanist this arrangement is perhaps more satisfactory than the broader divisions of Stapf[8]:—

(1) *The hill zone*, from the littoral zone of the coast up to 3,000 feet.

(2) *The lower mountain zone*, 3,000 feet—6,000 feet.

(3) *The upper mountain zone*, 6,000 feet—10,500 feet.

(4) *The summit zone*, 10,500 feet—13,455 feet.

Without going into a great amount of detail concerning the distribution of some invertebrate groups, it seems that the distribution of animals can be very conveniently expressed in terms of Stapf's zones.

The area between Kinabalu and the sea is largely cultivated land or secondary forest, but the effect on animal life of the comparatively recent artificial clearing is as yet not profound. The original lowland fauna of the region still persists in the isolated patches of primary jungle, usually situated on the higher ground. There has been an infiltration of certain species through the cultivated tracts into areas they probably would not occupy under normal conditions.

To the zoologist, therefore, no fundamental difference exists between the first two divisions of both authors, the first division containing the relics of the fauna of the second. Our division of the mountain into faunal zones is as follows:—

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[7] Journ. Linn. Soc., Botany, XLII, 1914, p. 49.

[8] Trans. Linn. Soc., ser. 2, IV, 1894, pp. 66–263, pls. 11–20.

(1) *The lowland zone.* The primary forest up to 3,000 feet. The fauna is probably identical with that of any area of old forest at sea-level in North Borneo. In Borneo, montane and sub-montane forms occur commonly at 3,500 ft., less commonly at 3,000 feet, and normally never below the latter altitude. The lowland fauna is almost excluded at 4,000 feet but wandering individuals are found more commonly at higher altitudes than are stray examples of mountain species at low elevations. Animals are abundant in this zone.

(2) *The mountain zone.* All the forest, high primary, mossy and low-sheltered, up to the tree-limit at about 10,500 feet. The mountain fauna may be said to commence at 3,000 feet. Most of its members are found throughout the whole zone, but it seems just possible to recognize two elements:—

(*a*) *The lower mountain zone.* From 3,000 feet to 6,000 feet. The zone of the high forest in which lowland species occur sporadically. Certain species of a peculiar sub-montane habitat are also characteristic of this division. Animals are abundant.

(*b*) *The higher mountain zone.* From 6,000 feet to 10,500 feet. The vegetation above the primary high forest up to the tree-limit. Lowland forms are completely excluded; sub-montane forms are rare and some true montane species shun the higher levels of this zone. A few species are found here more commonly than at lower levels. Animal life is less abundant.

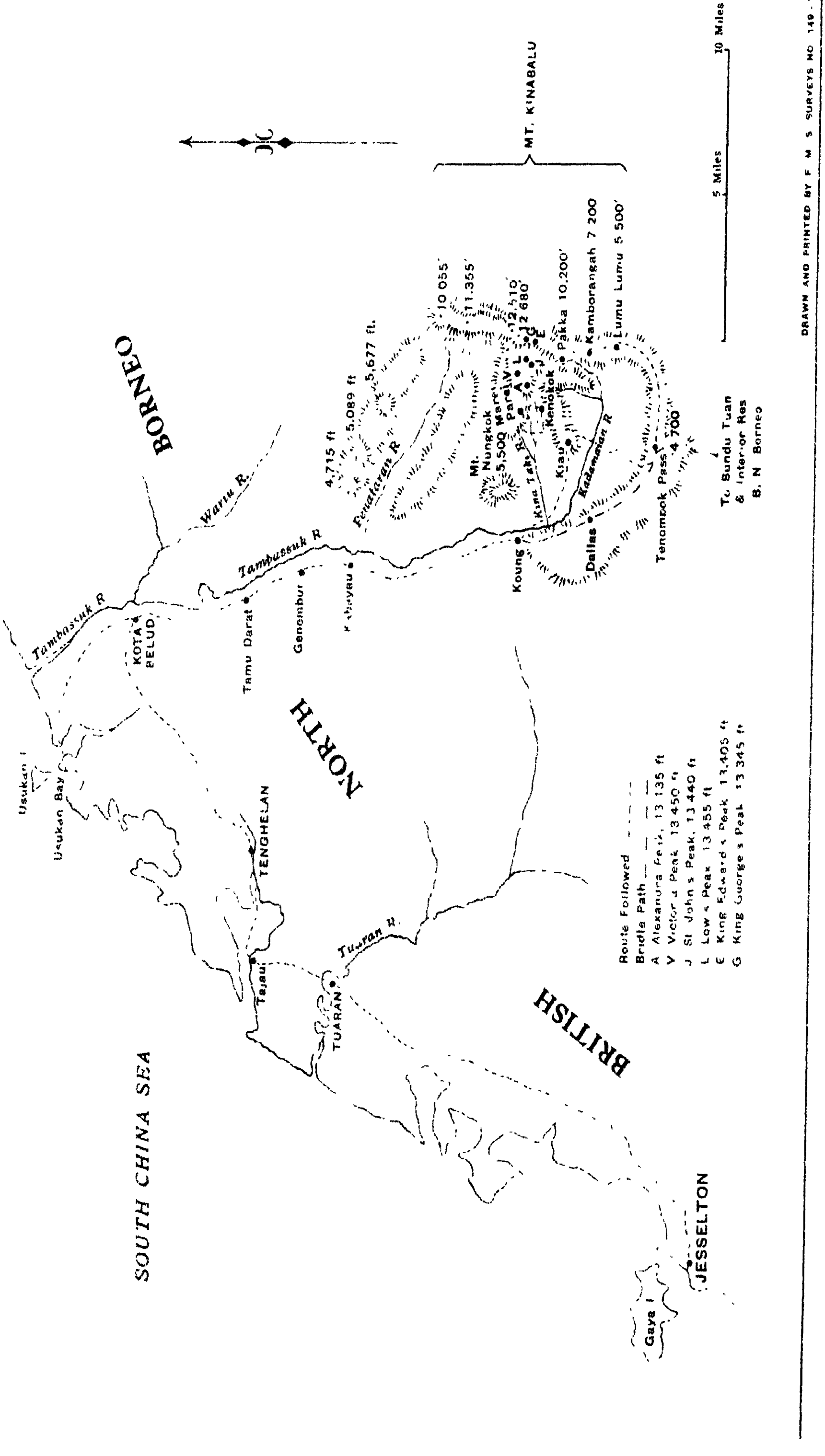
(3) *The summit zone.* Above 10,500 feet. The sub-summit dwarf vegetation above the true tree-level and the exposed granite core.

Life is scarce and the occurrence of vertebrates is casual.

Any such division as that indicated must of course be arbitrary in nature, especially when considered in relation to the mobile animal groups. It must always be modified if it is accurately to express the condition prevailing in any one group of animals. The faunal zones are possibly best marked in certain groups of insects, fairly obvious in birds and mammals, but less appreciable in reptiles and batrachians.

The following is a list of the collecting stations and their characteristics:—

Kabayau. 600 feet (The lowland zone).



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The collections made here are really not germane to the present paper. They are from the jungle which, except for isolated patches, is of secondary growth, near the halting-bungalow on the bridle-path.

Koung. 1,300 feet. (The lowland zone).

A very pleasantly situated Dusun village with a halting-bungalow, on the bridle-path leading to the mountain.

The surrounding country is largely cultivated but there are small areas of old jungle on the neighbouring hill-tops and in the deep gullies. Koung was used purely as a halting place but it yielded a few specimens.

Kiau. 3,000 feet. (The lower mountain zone).

A Dusun village at the foot of the mountain. Although there is no old forest near the village, Kiau is a good collecting ground and the prevailing secondary growth and thin lines of primary forest wisely left by the Dusuns on the ridges and steep slopes produce both mountain and lowland forms.

The base camp was established at Kiau and specimens were collected there before and after the two ascents of the mountain, and also by a collector permanently stationed in the village in charge of stores.

Kenokok. 3,300 feet. (The lower mountain zone).

An excellent collecting ground situated in very high old forest. The camp was in the Kenokok valley on the right bank of the stream which eventually joins the Kinataki River.

Lobang. 4,000 feet. (The lower mountain zone).

A large overhanging rock on the left bank of the Kadamaian River surrounded by heavy jungle. Until the new and less steep way up-the mountain (via Dallas halting bungalow, Tenompok and Lumu Lumu) was discovered, the Lobang Cave was usually used by travellers for the first night's camp after leaving Kiau.

Lobang was not visited by any of the party but the old route was always used by the Dusun coolies on their way to and from the various camps and a few specimens collected by them during their short rests at Lobang are included in the collection.

Tenompok. 4,700 feet. (The lower mountain zone).

A patch of heavy forest left among the secondary growth on the lower slope of the main spur. A few specimens were collected here during a halt on the ascent.

Marei Parei. 5,000 feet. (The lower mountain zone).

A subsidiary spur of the mountain reached by crossing the river north of Kiau, various streams, and finally the Kinataki River. The camp here was in very open country—

the "scrub formation" of Miss Gibbs—but there was jungle, bamboo in its upper regions, close at hand below the camp.

Lumu Lumu. 5,500 feet. (The lower mountain zone).

The camp was in dense forest, tall but very mossy, on the main spur of the mountain.

Kamborangah. 7,200 feet. (The higher mountain zone).

A ridge on the main spur of the mountain. The camp was in mossy forest but this was lower and more scrubby than at Lumu Lumu.

Pakka. 10,200 feet. (The higher mountain and summit zones).

The highest camp, made in a small cave formed by a large overhanging rock on the left bank of the Kadamaian River. From this camp the summit (13,455 feet) was visited once and the tree-limit on many occasions. Collecting was carried out above the camp in the upper regions of the low sheltered forest of the tree-limit, and on the granite core above this.

ITINERARY.[7]

Together with seven Dyak collectors and two Chinese "boys" (one of whom acted as cook) we left Singapore by the s.s. "Kajang" on the evening of March 2nd 1929. Rough weather delayed us: we stood off Miri on March 6th for twenty-four hours, and reached Labuan[8] on March 8th, and Jesselton the following morning.

Our original intention was to take a coastal boat from Jesselton to Usukan Bay, a short distance to the north, whence the journey to Kota Belud is a matter of only seven miles. We were informed, however, on our arrival at Jesselton that the usual boat would not be running for another three weeks, but delay was avoided through the ever ready assistance given to us by the Hon'ble Mr. C. F. C. Macaskie, Resident of the West Coast, who suggested that we take the overland route to Kota Belud *via* Tuaran, Tajau, and Tenghelan; he also made all necessary arrangements.

It is almost impossible adequately to express our thanks to the officers of the British North Borneo Government who assisted us and interested themselves on our behalf; they helped us in every possible way, and the success of our visit was in no small measure due to their cordial co-operation which we deeply appreciated.

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[7] In view of the fact that Borneo is now a well known country some may question the necessity for the publication of a detailed itinerary, but our view is that the time is still far distant when such accounts will cease to be of interest and help to travelling naturalists in the northern part of the island.

[8] The island of Labuan, classical ground to a naturalist, is now a very poor locality for collecting. The area of original jungle left is extremely small and limited to scanty patches on the tops of the hills and in the ravines. Many of the animals obtained there by early naturalists no longer exist on the island.

On March 12th we left Jesselton in Ford cars and arrived at the end of the motor road at Tuaran (24 miles) at about 8 a.m. Here, all our baggage had to be ferried across the Tuaran river in small dug-outs, after which there was a "carry" of about three and a half miles through low-lying country before we reached the "inland sea" near Tajau. Coolies and ponies were kindly provided by Mr. A. N. Campbell, Assistant District Officer at Tuaran. Praus were ready at Tajau and everything was stowed by 11.30 a.m. After a steady paddle of about two and a half hours we reached Tenghelan where a hundred coolies and two fresh ponies had been sent down from Kota Belud to meet us; we were soon on the march.

The first stage of this journey was through rice-fields, and then we rose gradually over some hills through patches of secondary jungle. This part was one of the hottest marches we have ever done: there was no shade, and not a breath of air to mitigate the fierce rising heat. On reaching the "divide" we were greeted by a cool sea breeze, and after traversing some undulating and in parts very barren looking country—low, lalang-covered hills with a few scattered trees and bushes—we reached Kota Belud at dusk and were hospitably entertained by Mr. R. F. Evans, the District Officer.

There was little of interest to be seen in the open country crossed on this first day. Green pigeons were abundant in pairs and were almost certainly breeding. A few Harriers also appeared and Bornean Serpent-Eagles were particularly common. These latter were rarely out of sight, and on one occasion we had five in view.

Kota Belud, or the "Fort on the Hill," is the headquarters of the Tampassuk District. The District Officer's bungalow occupies the summit of the hill and from it one obtains excellent views of the surrounding country: to the north the coast line and the islands of Mantanani; to the east the Pindasan plain on which several low, lalang-covered hills are a feature. To the south one looks towards the stately Kinabalu massif (frontispiece); this view is particularly fine. Major C. M. Enriquez who visited the mountain in 1925[9] describes his impressions as follows:—

"Sunrise on the following morning gave us our first really good view of Kinabalu, which from Kotabelud is seen broadside on high above everything else, and sweeping up into the sky in mighty precipices. We had not seen it properly again since the distant view from Labuan, and its uncompromising splendour, now revealed at comparatively close quarters, was quite awe-inspiring. I do not hesitate to admit that it filled me with misgivings."

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[9] "Kinabalu, the Haunted Mountain of Borneo." 1927. (H. F. & G. Witherby).

"After seeing Kinabalu from many angles, I think this aspect of it from a distance of, say, 25 miles, is probably the most imposing of all, displaying as it does the full majesty and aloofness of the mountain. Its relation to the surrounding country, its superb loneliness, are here seen in proper perspective."

The western part of the mountain consists of a large granite core on which the highest peaks are concentrated; from this, running off east and then northwards is a long ridge terminated by a sharp peak, Mt. Nonohan (10,055 feet).

To the west, and partially disconnected from the main mass lies a conical hill called Mt. Nungkok (5,500 feet) or Saduk Saduk; it is also known as Kinabalu's child. The intervening country between Kota Belud and the mountain is partly under cultivation, and with the exception of two ranges of hills, one near Tamu Darat and one near Kabayau, is fairly flat or gently undulating.

Kota Belud is typical of the "outstation" in Borneo. Besides the District Officer's quarters there is a Police station and gaol. There are a few rows of Chinese shop houses in the village and of course Bajau houses dotted about over the landscape.

On the morning after our arrival we met the "Orang Tua," Lamat of Kiau, who acted as our guide, controlled our carriers who were all Dusun natives mostly from Kiau, and altogether proved himself to be a most useful and excellent headman.

At Kota Belud we also found a stock of carrying baskets or "bongons" which had been made specially for us. These bongons (or basongs as they are sometimes termed) are used for carrying small articles of baggage on the back. They are roughly cylindrical in shape being wider at the top than at the bottom: they vary slightly in size but their measurements are more or less as follows—outside height 31–34 inches, width at the top 15–17 inches, at the bottom 9 inches. All bongons are fitted with a wooden top to the lid, but otherwise they consist of a part of the spathe of a sago palm, and bark of certain trees fastened together with rattan. No metal comes into their construction at all. They are fixed to a board (28″–31″ high and 7″–8″ wide) through which the rattan shoulder straps are fastened. They are an excellent carrying medium and are perfectly watertight even during the heaviest rainstorm Usually they are filled with an odd assortment of baggage; tinned foods, clothing, bedding and vegetables not uncommonly forming a single load. The Dusun porters were, on the whole, excellent, and could carry a load of 50 lbs.

(sometimes even more) throughout a long day of rough travel going up steep, sometimes very steep, slopes, without a murmur. Specimen boxes and articles which could not be reduced to smaller bulk were carried on back-boards a supply of which we had brought from Singapore.

On March 13th, after having repacked most of the baggage into bongons we left Kota Belud for Kabayau, our first stage of about eighteen miles in the journey to the mountain, and took with us 107 carriers.

To a naturalist this part of the journey is of little interest as the country is open, and partly cultivated. The path from Kota Belud which leads eventually right into the interior of the State of North Borneo, kept to the left bank of the Tampassuk river.

It took us about two hours to reach Tamu Darat which is about seven miles from Kota Belud and where there is a halting bungalow. The name Tamu Darat implies that up-country markets are held here at various times: Dusuns from the hinterland bring in jungle produce for sale or barter with merchants from the towns and villages. These fairs are important events and have been described fully and intimately in many books dealing with North Borneo and its peoples.

After a short halt at Tamu Darat we continued our journey and covered the next eleven miles to Kabayau in about four hours. Rain fell heavily and persistently as we left Tamu Darat; a few miles further on we reached Genembur where the bridle-path begins to wind a rather tortuous course round the eastern slopes of Bukit Menungohi, until at Kabayau we were at an altitude of 600 ft. Here, there is a halting bungalow situated between the bridle-path and the Tampassuk river. Most of the flat land in this part is, or has been at some recent time, under cultivation, but there are stretches of jungle on the hills above the path.

We left Kabayau for Koung (ten miles) on March 15th; the country now began to get more picturesque and we had some beautiful views down to the Tampassuk river. Taking it fairly easily we covered the journey in four hours.

Koung village (1,300 feet) nestles at the western foot of the cone-shaped Mt. Nungkok. As at Kabayau there is a halting bungalow here standing in a cleared space a little below the bridle-path and on the left bank of the Tampassuk river.

The attractive looking village (Plate II*a*) lies beyond the river (on the right bank). News of our coming must have preceded us as almost immediately after our arrival several village children in hope of a reward appeared carrying beetles, grasshoppers etc., strung together ingeniously on thin pieces of rattan.

Had we been a small party travelling light, we should have proceeded from Koung along the bridle path to Dallas (3,000 feet) which is nine miles distant, and thence to Tenompok Pass (8 miles), but as it was we found it necessary to use Kiau as our base camp and recruiting ground for carriers.

Therefore, on the following morning (March 16th) we left for Kiau village which is about five and a half miles from Koung. Taking the left fork of the bridle path, we crossed the Tampassuk river above Koung and a short distance further on forded the Kinataki river, and then climbed up fairly steep slopes through open country and secondary jungle growth until we reached Kiau which lies on the south-western spur of the mountain at an elevation of about 3,000 ft., and found the halting bungalow on a pleasant open site with good views. Looking to the west we saw below us a deep and rather steep valley at the bottom of which runs the Kadamaian river (the upper waters of the Tampassuk): on the opposite side of the valley, cuttings above the bridle path were visible, and the halting bungalow at Dallas bearing about west-south-west. To the east we saw the forbidding, bare, steep, granite slopes of Kinabalu frowning over the top of the spur above Kiau: or delighting the eye with innumerable silvery streaks—water courses after a shower—or tinted in the evening with a pink or purple alpine glow which so rapidly changes in this short twilight to sombre grey, and then to blackness.

At Kiau the local *pawang*[10] named Darunsai attached himself to our party, his services being essential for propitiating the "Spirits of the Mountain." The Dusuns of course regard the summit of Kinabalu as the resting place of the shades of the departed, and before anyone visits the summit slopes it is necessary for the spirits to be warned by a firing of shots, and for certain presents to be made as an apology for intrusion, so that the party will have safe conduct through the haunted regions[11]. It is easy to understand how these superstitions persist: most of the Dusuns in this part know little of the world beyond Kota Belud; and even in countries that can boast of a higher civilization there will be found many who hold quite definite convictions about certain mythological ideas.

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[10] *Pawang* in this case implies a practitioner in certain ceremonies connected with the animistic beliefs of his people.

[11] Mt. Kinabalu is of course only one of the many haunted mountains in Malaysia. Gunong Tahan, the highest mountain in the Malay Peninsula, according to native tradition, had a gigantic *brok* as large as a rhinoceros which guarded two pots containing the "ibu mas" and the "ibu perak." Mr. R. J. Wilkinson (Journ. Mal. Br. Roy. Asiat. Soc., X, I, 1932, pp. 106–110) calls attention to two other peaks in the Malay States, Mt. Ophir with its fairy princess, and Rembau Peak with its guardian spirit: also to Indrapura, Dempo, and Merapi in Sumatra; Sĕmĕru in Java and Batu Lawi in Borneo. Before climbing any of these mountains to the summit it is deemed wise to propitiate the spirits by some small service.

A young lad by name Malim, still in his 'teens, also attached himself to our party by virtue of the fact that he was reputed to be the hereditary chief of Kiau. He was therefore provided with a blanket and a flannel shirt, as also were the chosen few who accompanied us to the summit.

The next day was spent in sorting out stores for the various camps to be made on the mountain. We were interrupted continually by Dusuns of all ages and both sexes who brought in specimens of all kinds, in fact anything that might be worth a few cents, and after a time we had to place a sentry at the entrance of the hut to weed out the rubbish. We decided that the most satisfactory arrangement was to give "chits," which were all carefully cashed before we left the district.

The pagan Dusuns[12] are the Indonesian inhabitants of the hills in the Tampassuk district. It is true that they have a few villages on the plains, but these latter together with the coasts are normally inhabited by the Muhammadan Bajaus and Illanuns. The two last-mentioned races seem to have been late arrivals in Borneo, no doubt driving the Dusuns before them into the foothills. The Dusuns are short, sturdy, cheerful, and not over-clean folk, amicable in disposition, but too shrewd and argumentative in bargaining to inspire much affection, and with a penchant for getting drunk on their rice-spirit. But these minor blemishes in no way detracted from their other excellent qualities as they were reliable and well-disciplined carriers and to the villagers of Kiau the success of our trip is largely due. They never once disappointed us and were always ready at the right time and on the right day even though our instructions were given sometimes a week or a fortnight beforehand. For this of course Lamat was primarily responsible, and he always saw to it that the requisite number of carriers was present. One of our collectors remained at Kiau in charge of the balance of our provisions and baggage and to forward necessary supplies from time to time. He did some collecting also.

Kiau is a peculiar locality as its fauna is in a most interesting transitional stage: lowland forms occur side by side with submontane animals in which may be included the following birds, *Macropygia nana*, *Chotorhea monticola*, *Mesobucco eximius*, *Turdinus canicapillus*, and *Cissa minor*.

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[12] "Dusun" in the Malay language means a hamlet, village or an orchard, or a collection of houses containing at least forty residents. The name has been loosely applied to the people with whom we are concerned at present, and adopted. *Cf.* the high Javanese word *dusun* (low Javanese, *dessa*) meaning, a village.

Even much higher ranging birds occur at or very near Kiau—*Rhipidura albicollis, Pericrocotus montanus, Calyptomena whiteheadi* and many others.

At the level of Kiau, batrachians, lizards, and snakes were of course very common, and the number of species secured in these groups was 16, 19, and 19 respectively.

Insects also shewed the same noteworthy intermixture of forms as the vertebrates, several of the common lowland butterflies for instance being seen with essentially montane and submontane species. There seemed to be no definite segregation as one would expect to find at a similar altitude in heavily afforested country.

The more conspicuous beetles included Lucanidae (*Odontolabis*), Cetoniinae (especially the genera *Theodosia* and *Pseudochalcothea*), and certain Longicornia (*Batocera, Diastocera* etc.). Of the seven known species of *Theodosia,* five are found on Mt. Kinabalu, and are probably confined to the neighbourhood of Kiau, as no further specimens were taken or even seen after we had left that locality. Such timber beetles as the Buprestidae, Anthribidae, and Brenthidae were scarce while we were at Kiau, and the damp, mossy, character of the forest higher up the mountain appeared to be inimicable to them.

Dragonflies were fairly common and frequented the muddy pools and buffalo wallows below the halting bungalow, and many typical low level open country insects were found among the stretches of secondary growth that had sprung up on this grassy hillside. This secondary jungle is allowed to grow for about seven years before it is cleared again for cultivation.

Some of the specimens that were brought in by the Dusuns were obtained most probably at a rather higher altitude on the well wooded Gurulau spur which runs up behind the village and forms one of the buttresses of the mountain.

We left Kiau on the morning of March 18th with 70 Dusun porters: we did not get away as early as had been hoped owing to last-minute bargaining which took nearly an hour to settle. Our track now led down to a lower part of the village in an easterly direction, and we passed the the treaty stone planted during Mr. R. M. Little's visit to the mountain in 1887 when he came to receive the submission of the native chiefs in this district. Following the track down we crossed the Kadamaian river and then started on a tedious climb up the opposite and steeper side of the valley where there was a vile path consisting of loose and slippery stones partly hidden in "lalang" and other vegetation. It was very hot by the time we were half-way up this slope as the sun had appeared over the hill tops, and there was no shade: we had been going nearly three hours when we reached the main bridle path to Bundu Tuhan and the " Interior," and followed this as far as Tenompok Pass which is at about 4,700 feet above sea-level.

We decided to stay here for the night as the carriers were straggling very much and it was late in the afternoon before they all arrived and settled into camp. Tenompok Pass itself is not an ideal camping site for a large party as there is very little flat ground and no water near at hand; however, the locality is one in which there is an abundance of wild life. Especially noticeable was a large number of spiders (*Leucauge* sp.) which seemed to be spinning their webs everywhere, and numerous field crickets (*Nisitra* sp.) in all stages of development were seen feeding on the varied vegetation, especially on the abundant large-leaved aroids.

Early next morning (March 19th) we struck camp in a heavy "Scotch " mist, and continued along the bridle path in the direction of Ranau for about two hundred yards, then turned off the path sharply to the left into heavy forest and followed a narrow trail which was heavily encumbered with slippery logs, matted roots, and harboured numerous leeches; the conditions improved later. The path we were now on was cut in 1923 by orders of the Governor at that time, Sir William Rycroft. It was designed to supersede the old route followed by explorers which led from Kiau along the bed of the Kadamaian River and ended in a heartbreaking climb up a steep and slippery slope to Lobang Cave at 4,000 feet, and thence to Kamborangah and Pakka.

At about 5,500 feet we found ourselves well into the " mossy forest " area: the Dusuns referred to this place as Lumu Lumu. After a short halt we climbed without respite until we reached the famous " wind-swept ridge of Kamborangah " which is at an elevation of about 7,200 feet. Rain fell incessantly during the latter part of this journey but within a short time of our arrival we had pitched our camp and settled in. The walk from Tenompok Pass to Kamborangah took five hours.

We left some of our collectors and most of our stores in this camp and started off next morning (March 20th) with four Dyaks and forty carriers for Pakka. The path up involved continuous climbing over matted roots and fallen logs, and later on over patches of exposed rock. When traversing some of the narrow ridges one became acutely conscious of the fact that there was but little support underfoot and that one could see quite a long way down the mountain through some of the matted roots on which we walked.

At about 7,500 feet we saw for the first time the black and chestnut Kinabalu Thrush (*Merula seebohmi*) peculiar to the upper slopes of this mountain; we also saw tracks of a rhinoceros from just below 8,000 feet up to 8,300 feet. Pitcher-plants (*Nepenthes villosa*) were plentiful all the way up. There had been a heavy mist all day, and rain fell shortly before we reached Pakka Cave after climbing for about three hours.

The "arctic" conditions at Pakka were rather trying at first as the rain was driven by a bitterly cold wind and it took a long time to get a fire started as such wood as we managed to collect was very wet. For this reason we made a point of stacking a fair amount of dry firewood in the driest part of Pakka Cave before leaving it on our return journey; future visitors to the cave may find it useful, and follow the example.

Pakka "Cave" is about 10,200 feet (Plate III*a*); it consists of a large overhanging granite boulder supported on three sides: the cave, so formed, is only about fifteen feet in depth and narrows considerably at the inner end. It stands literally on the edge of the left bank of the Kadamaian river, within a few hundred yards of its source. Immediately below the cave the river runs down in a long cascade.

A shower of rain on the mountain converts this little stream into a raging torrent which comes down with a roar increasing in intensity every moment until one quite expects the cave to be inundated. Rocks which normally stand some six feet or more above the stream bed are covered, and the spray is shot forward several yards beyond them; and this is close to the source. The river takes about three hours to run down to normal and it may flood several times during the day. The water felt icy cold, and at Pakka there was no enthusiasm about bathing, in fact the average daily toilet was a very sketchy affair. The ground about the cave was permanently saturated and supported only hardy vegetation. The outstanding feature was *Leptospermum*, the wood of which we used for fuel although it is rather hard to cut and gives off an acrid smoke; it was, however, the only wood available in quantity, for any fallen timber was sodden and moss-covered. The site of the cave is particularly cold and bleak: it faces almost due west and never gets the direct rays of the sun, for, by the time the sun has risen to a point high enough to catch even a part of these slopes, it has been obliterated by mists and rain, moreover the solid rock helps to maintain the cave temperature at a low degree. An adequate supply of warm clothing is advisable when a stay of several days is contemplated, owing to the daily drenchings and the difficulty of drying wet garments.

The jungle above Pakka Cave consists of about two hundred feet of constantly damp forest and beyond this one reaches the stunted vegetation area in which the forest is more open, drier, and much less mossy; the moss-covered trees being entirely absent. This continues to the tree-limit which is an irregular line running up rather higher on some slopes than others, but roughly speaking at 10,500–11,500 feet (Plate IV).

The change in the character of the forest is very apparent during the short journey from the cave to the tree-limit. As one climbs, the forest opens out and becomes lower, and in a few very exposed places—even below 10,500 feet—the vegetation is less than the height of a man.

In this zone (the dwarf sub-summit forest of Miss Gibbs) the ground is comparatively bare, although between the scattered granite boulders there are tufts of grass, patches of moss and some ferns (mainly *Gleichenia* and *Plagiogyria*), and on the boulders a greyish-white lichen is very conspicuous.

The main impression at this altitude is of a dwarfed forest without large trees. In it the bare, twisted, branches of *Leptospermum* are predominant, and to the casual observer the remainder of the jungle seems to be composed of very few species of small trees most noticeable among them being the conifers *Dacrydium* and *Phyllocladus;* tufts of a sedge, *Gahnia*, and a variety of *Lycopodium clavatum*. At the time of our visit flowers were very abundant, especially rhododendrons and the beautiful white blossoms of *Schima*.[13]

Above this is the bare granite core, though there are stretches of low-growing vegetation (dwarf *Leptospermum* etc.) leading up some of the sheltered gullies to within a few hundred feet of the top crest, and some plants are to be found even on the summit slopes striving to exist in the crevices of rock. The Dusuns say that phantom buffaloes feed upon them.

As March 21st was not considered a propitious day for visiting the summit, according to our *pawang*, we postponed this project until March 22nd, and though we were ready to make an early start, the guides and several carriers who had attached themselves to our party did not appear to thaw until nearly 8 o'clock.

We followed the track up to the tree limit and on reaching some fairly flat ground known as Sayat Sayat[14] at the foot of the bare granite slopes, the *pawang*, wearing his regalia of charms, went through the usual formalities with regard to propitiating the spirits of the mountain. This ceremony consisted of a total offering of seven fowls and seven eggs, together with a certain amount of rice and betel-nut. The *pawang* who had previously made orisons at Kamborangah and Pakka (leaving some gifts at each of these places), now exhibited an unwonted fervency, and distributed the remainder of the offerings in a wide circle. When this had been done, he directed the firing of two shots, and then we commenced to climb up over the bare rock (Plate IV *a*); almost at the same moment mists enveloped the summit and it began to drizzle.

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[13] Mr. R. E. Holttum, Director of Gardens S.S., has kindly identified some plants for us.

[14] The name Sayat Sayat, which is a Dusun word meaning "heather," was originally applied to a place higher up the mountain at about 12,000 feet.

The first part of the ascent was hardest, as long, rather convex ridges of rock made slippery by recent wet weather had to be negotiated. One of us wore nailed boots and the other boots without nails and both seemed equally suitable for the purpose. The balance and step necessary for walking up these slopes is soon acquired and is identical with that used when going up a snow slope on skis. A suggestion which might be useful for future visitors to the summit is to wear a pair of leather gloves for protection in case one slips on the very sharp granite surface. The finger tips especially are apt to suffer as it is necessary to use hands as well as feet when the slope attains a certain pitch. Progress was slow owing to the rarity of the atmosphere and several halts had to be made to recover breath. The Dusuns were of utmost assistance during the early and more difficult part of this climb, and if one started to slip there was always a helping or supporting hand. As we rose higher a strong biting wind caused the Dusuns to drop out one by one and seek some sheltered crevice, and by the time we reached the summit slopes only one of our guides remained, and he appeared to be unaffected by the elements. The going was very much easier when nearing the top crest and it did not take us long to scramble up the piled up rocks to the top of Low's Peak, the highest point in Malaysia, 13,455 feet (Plate V).

On our arrival here, the sun made an effort to penetrate the mists and we were able to see Victoria and Alexandra Peaks (north-west), St. John's Peak (south-west), the deep rift below us known as Low's Abyss, and several of the grotesque peaks and pinnacles which rise sheer from the summit plateau like turrets and battlements on a mediæval castle, and are such a feature of the mountain. (Plates VI, VII, and VIII).

We followed the usual custom of writing the names of the party, with the date and time on a piece of paper which was put into a small bottle and slipped into one of the crevices of rock at the top of Low's Peak.

We had passed at the foot of the Peak remains of a *sulap* (shelter) left by Messrs. R. F. Evans and C. R. Sarel in 1924. In the report upon their visit when they spent a night at the summit, it is interesting to note that their thermometer registered 30° F. at 6 a.m., and that the pool at the foot of Low's Peak was frozen over. Previous visitors have recorded ice, and the wet glistening rock surfaces, seen from a distance in the early morning, have given rise to a legend of a snow-clad summit. A heavy fall of hail may provide the illusion also, but the summit of the mountain is actually slightly more than 1,500 feet below the snow line at this latitude.

The man who carried the camera eventually reached us, and some photographs were taken when the mist thinned momentarily. Our *pawang* also appeared, and after making further invocations (which were possibly rather scamped owing to the weather conditions), he ordered the firing of two shots to warn the spirits of our safe arrival and impending departure. The mists closed in and heavy rain started to fall, so we lost no time in retracing our steps as it would be a simple matter to lose one's way on these inhospitable slopes. As a matter of fact we did go astray on one occasion, but managed to get back to our original line lower down after traversing some rather nasty places, and returned to Pakka with nothing more than a soaking and some scratches.

The new boots that had been worn for the occasion were unfit for further service, and several good pairs of trousers suffered severely. The descent was, if anything, the more trying, but with care and judicious use of the numerous rock-crevices one should be quite sure-footed. We found the Dusuns some way down the slope in a distressed condition, with chattering teeth, weeping, and nearly paralysed by the cold. However, we dispensed an efficient remedy from a bottle on our return to Pakka, which helped them to forget their troubles very rapidly.

The journey from Pakka Cave to the summit of Low's Peak took us two and a half hours, and the journey back two and a quarter hours.

On a chosen fine day this excursion would be a pleasant though tiring event. Some writers have exaggerated the difficulty of the climb, but anyone without rock-climbing experience should manage it, given normal health and freedom from mountain sickness. In bad weather when thick mist and rain cause low visibility it would be definitely a dangerous undertaking: firstly, on account of the difficulty in finding the way, especially on the return journey when the margin of error allowed is very small; and secondly, owing to the slippery rock surfaces accentuated by the actual running water on the bare slopes.

Next day, March 23rd, collecting started in earnest, but the fauna, as is to be expected, is poor at this altitude.

Very few mammals occur above Pakka. We saw a ground squirrel, *Drymomys*, at 11,000 feet, but with the possible exception of a shrew (*Crocidura*), we consider that *Rattus baluensis* is the only mammal truly resident in the low-sheltered forest zone: among the specimens caught was a juvenile. Even the rat does not appear to be numerous. One specimen of *Rattus alticola* was trapped and one *Drymomys*. This result for a week's collecting points to the fact that Pakka is on the upper limit of the altitudinal mammalian range. No bats were seen.

Although we obtained a fair series of birds, it seems, at least at the time of our visit, that the real resident birds above Pakka are:—a thrush (*Merula seebohmi*), a white-eye (*Chlorocharis emiliae*), and a warbler (*Horornis oreophila*). All these are very common, occur regularly as high as the tree-limit, and sporadically higher.

Near Pakka we collected also *Muscicapula malayana*, *Androphilus accentor*, *Cryptolopha kinabaluensis*, *Rhinocichla treacheri*, and *Oreostictus leucops*—all resident birds but sufficiently uncommon to justify exclusion from the list of regular inhabitants. The *Rhinocichla* obtained was the only example seen by any of the party during the week. Some *Turdus obscurus* were, of course, migrants.

Undoubtedly the most striking bird of the very high levels is *Merula seebohmi*. This bold and confiding thrush is common at Pakka and it is found quite up to the tree-limit at 10,500 feet. The lowest record is a specimen at 7,500 feet, but the species was not found at Kamborangah camp at 7,200 feet. It is usually seen in pairs or singly searching for food among the stunted trees or on the ground, or sitting on boulders in the middle of the rushing mountain torrent. It is very true to the family in its habits, deliberate in its actions, and progresses by long hops. So far as distance would allow the comparison, the voice seemed like that of the European Blackbird.

Horornis oreophila was usually seen working its way through the scrub near the ground: it is very wren-like in its actions.

Chlorocharis emiliae was the commonest bird at Pakka and at all altitudes above 10,000 feet. It is numerous at the tree-limit and even casually occurs higher as it follows the scattered patches of vegetation on to the granite. It wanders through the low, damp forest in small, scattered parties, and is equally noticeable in the bright morning hours as during the periods of mist and drizzle so common at high levels on the mountain. *Chlorocharis* is a fearless little bird and will approach an observer to within three feet or less.

No reptiles were obtained at Pakka. Three species of batrachian were collected but they were not particularly common. *Nectophyryne altitudinis* was secured at 10,300 feet: the stomach of this specimen contained fragments of beetles and small crustacea among other things.

With regard to the invertebrates, two small species of land-snail were found, and slugs were very common between Pakka and the tree-limit especially after rain. A number of earthworms, including a very large form, were also collected. A series of a small and very active reddish coloured shrimp (Amphipoda), was found under stones and among fallen leaves; this mountain shrimp can jump as elusively as its seashore relatives.

Myriapoda (worm-like millipedes, *Helminthomorpha*, and centipedes, Lithobiidae and Geophilidae), were fairly numerous under bark of trees, among fallen leaves, under stones, and in hollow rotting tree trunks. Nearly all the less active or unobtrusive species were discovered in one or other of these habitats. Spiders were scarce at this altitude, but an Opilionine species was collected inside Pakka Cave. All the millipedes, centipedes, and spiders were of small species. A few *Isopoda* and a leech (*Hirudinea*) were obtained also.

The most numerous insects belonged to the fragile nematocerous Diptera, but even in this suborder the number of species was limited. Fungus midges and Craneflies were individually the most plentiful owing to the ideal local conditions. A single specimen of *Simulium* was taken inside the cave, and a species of *Anisopus* flew in to light on several occasions.

Four of the five species of Syrphidae[15] were hitherto unknown, and two of these were found again at lower elevations also. The Calyptrate Diptera (according to Mr. J. R. Malloch who has only been able so far to examine them superficially) consist of genera found in the Palearctic Region and southward into Asia where they become scarcer. There was one species of *Calliphora*, probably a race of *malayana* Mall., which occurred more commonly lower down the mountain; one species of *Helina;* and three species of the Tachinid genus *Servillia*, probably *sobria* Wlk., *sumatrensis* Towns., and one undescribed. Nine other species of Diptera were taken also.

Coleoptera were represented chiefly by the family Tenebrionidae, found under bark and in rotting wood, sharing this habitat with about three species of Curculionidae. Three species of Chrysomelidae were collected from the flowers of *Schima robustum*, *Leptospermum* etc.: the rest of the beetles consisted of two species of Longicorn; two species of Carabidae[16]; a few Staphylinidae; three species of Elateridae, and one Malacoderm specimen which had probably strayed from 7,200 feet where it occurred commonly.

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[15] Curran: *loc. cit.* pp. 353, 359, 365 and 374.

The discovery of a species of Dermaptera (*Mongolabis*, see Borelli's report, *postea*), between Pakka and the tree-limit constitutes an altitudinal record for this order in Malaysia: many examples, including varieties, were taken under stones and the bark of trees. The species is almost exactly like one found in south Australia, and the varieties correspond with a form which occurs in north Australia.

Some Thysanoptera were collected from the flowers of *Schima robustum* and Coccidae were attached to the leaves of this same plant. Aleyrodidae formed small colonies on the underside of leaves on several trees, and two species of Delphacidae were taken. It is possible that a small cicada occurs near the tree-limit; we heard a strange note rather similar to that of a *Mogannia* in the depths of the scrub, but it was difficult to locate exactly and ceased abruptly whenever one endeavoured to approach. Several hours spent in diligent search for it proved fruitless.

The Orthoptera consisted of one species of Blattidae, one Stenopelmatid (*Rhaphidophora*), a few micropterous Tettigoniidae, and three apterous species of Phasmidae.

Trichoptera were numerous round our lamp at night, but only represented three species since described by Nathan Banks as *Goerinella grandis*, *Micrasema borneensis*, and *Allosetodes plutonis*. Several specimens of a Coniopterygid flew in at the same time.

One butterfly, a species of *Hasora*, was caught at about 10,500 feet where it was doubtless a casual visitor: another specimen—or possibly the same one—had been observed by us previously as it speeded through the mist at over 13,000 feet while we were returning from the summit. Seven species of Geometridae, representing the genera *Phthonoloba*, *Tympanota*, *Poecilasthena*, *Thalassodes*, *Chloroclystis*, *Sauris* and *Cleora*, a few Noctuidae, Pyralidae Tortricidae were collected also. Most of them came to our lamp at night and further specimens were caught on the herbage up to the tree-limit after dark.

Hymenoptera were scarce: a few (possibly phytophagous) Chalcidoidea and some Ichneumonidae represented the parasitic group, and the only Aculeates obtained consisted of a small series of *Apis mellifera indica* (at about 10,500 feet) which were undoubtedly wayfarers from lower down the mountain, and a single ant. A few specimens of Collembola and Thysanura were the only Aptera taken.

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[16] Andrewes: *loc. cit.* pp. 449 and 467.

We stayed at Pakka from March 20th until 26th, but during the last three days added little to the number of species previously collected. Almost all the collecting was carried out above the cave: the tree-limit was visited on many occasions and marked attention was also paid to the more easily accessible granite slopes.

On the morning of the 26th we moved down to Kamborangah. The carriers arrived about 11 a.m., and as some time was spent in collecting on the way down we only reached Kamborangah at about 3 p.m.

After leaving Pakka we passed through a mossy, damp area, but at 9,750 feet we were again in a dry zone in which the vegetation resembled that of the tree-limit; this was, of course, on an exposed ridge.

Pitcher plants soon began to occur (they appear to be absent above Pakka cave); for an hour or so the dry patches alternated with the very wet, mossy, sheltered areas of forest. There is, for instance, a recurrence of stunted vegetation on an exposed ridge at 9,500 feet, but the character of the forest changes again in a few yards. Before reaching the camping ground at Kamborangah (7,200 feet) the stunted, dry forest had disappeared even from the exposed ridges and at Kamborangah the forest is high, the trees large, but the whole still very mossy.

Just above Kamborangah, at about 8,000 feet, there was a flight of a *Henicocephalus* species. These small Hemiptera have a habit of flying in little groups of a dozen or more individuals in bright sunlight, much after the manner of certain small nematocerous Diptera or Ephemeroptera, but easily may be overlooked. At about 7,500 feet we found a large colony of the common oriental bee (*Apis mellifera indica*) in a hollow tree: this is an unusual height to find such a nest and it is put on record because the Dusun carriers made an end to it and secured the honey the same day.

Our camp at Kamborangah was situated on a long and rather narrow ridge with steep sides, on the left bank of the Kadamaian river, which roared in the valley several hundred feet below. There was no good water supply near at hand though sunken pits below the camp supplied a small amount of a discoloured fluid after rain; all drinking water, therefore, had to be fetched from the Kadamaian river in the Minitindok gorge which entailed a strenuous walk of about a mile.

For our general utility men (water-carriers, wood-choppers etc.) we enlisted two of the biggest rogues among the carriers, men whose voices were always predominant in cases of argument or bargaining. The choice was a good one, however, as not only were these men excellent workers but they were also experienced trappers of no mean order. Their snares were made from saplings and creepers on the slip-knot principle, and they accounted for a large number of the smaller ground mammals and birds (*Lanioturdus*, *Brachypteryx*).

The vegetation at Kamborangah was typically montane and the trees were mostly moss-covered; there were patches of *Leptospermum* which here grew to about 12–15 feet, and several groups of that remarkable and beautiful pitcher plant, *Nepenthes lowii*, were found. This must be one of the most peculiar organisms in the vegetable kingdom. Unlike the ordinary straight-cupped pitcher plant, this species is constricted in the middle and the top half of the cup is twisted round at right angles to the lower half of the receptacle. In colour it is olive green with splashes of reddish-purple on the inside of the cup. The inside of the lid is covered with short bristles, carrying a whitish secretion. The pitchers vary in size: the larger specimens measured from base to apex round the curves being as much as fifteen inches; the cup measures from 6–7 inches lengthwise, and 3—3½ inches across.

This species is noteworthy as being found in its natural state nowhere else in the world, a distinction it shares with *Nepenthes rajah* which grows only on another part of the mountain. In the pitchers of *N. lowii* were found numerous culicine larvae, *Rachionotomyia vicina* Edw., as well as a number of "rat-tailed maggots," the larvae of a hover fly, which seemed to thrive in the sludge at the bottom of the pitcher; they can adjust their telescope-like breathing tubes to suit the varying elevation of the fluid in the receptacle, a remarkable adaptation.

Dr. F. W. Edwards of the British Museum has discussed the mosquitoes in an interesting paper "Mosquitoes breeding in Plant-Pitchers," published in the *Natural History Magazine*, III. 1931, pp. 25–28. In this paper he reproduces one of our photographs of *N. lowii*, but the measurements given are those of a small specimen.

Kamborangah was not a prolific collecting ground for vertebrates: the surrounding forest seemed very barren, but in spite of this numbers of mammals and birds were obtained. This was the highest point at which we heard the call of the Gibbons, but the animals may have been far below us in the valleys for their voice carries a long way: their upper limit on the mountain is probably at about 6,000 feet. During our stay we obtained *Rattus infraluteus*, *R. baluensis* (commoner than at Pakka), *Tupaia montana*, *Dendrogale*, *Hylomys*, *Drymomys*, *Sciurus jentincki*, *S. prevosti baluensis*, *Nannosciurus whiteheadi*, and *Helictis*. All these are true mountain forms and with the exception of *Rattus baluensis* are found throughout the mountain zone (see page 6). Most of our specimens were brought in by Dusun trappers who had more success with their primitive snares than our collectors who used more "scientific" and modern apparatus! We suspect that the Dusuns are quick at recognizing the track of an animal and set their snares for individuals.

In the flesh *Helictis* has a very strong but not unpleasant musk-like smell, but curiously enough its persistence produces nausea but not the vomiting caused by the almost intolerable odour of the nearly allied *Mydaus*.

One of our native collectors reported "red lotongs" at Kamborangah and confirmation from the Dusuns indicates that *Pygathrix rubicundus* does occasionally stray to about 7,000 feet.

From this camp we also observed a swiftlet with whitish underparts and therefore, no doubt, *Collocalia dodgei*, one of the very few species known to inhabit the mountain, and not obtained by us on this occasion.

The peculiar form of Serpent-eagle inhabiting Kinabalu (*Spilornis cheela kinabaluensis*) also occurs sporadically at 8,000 feet although its normal zone is lower—about 3,000–6,000 ft. In the lowlands of Borneo a smaller and paler form of the same species is found, *S. c. pallidus*. At the higher levels of the mountain *kinabaluensis* of course entirely replaces *pallidus*, but it is tolerably certain that on occasions the two forms must be found together at about 3,000 feet. From a point of vantage at 5,900 feet we watched a pair of *kinabaluensis* sail past and after circling round continue down into the valley and descend to at least 3,000 feet. Perhaps like some other species that can be separated into high and low level forms on this mountain the two races are now physiologically intolerant of each other even when they meet and mingle, as they certainly appear to do at the peripheries of their ranges.

Kamborangah was the highest point at which we found *Cuculus insulindae*, *Chotorhea pulcherrima*, *Muscicapula westermanni*, *Rhipidura albicollis* and many other mountain forms. All the species of birds obtained at Pakka were also collected at, or just above, Kamborangah; *Merula seebohmi* and *Horornis oreophila* were certainly less numerous at this lower level.

A snake, *Natrix murudensis*, was collected at 8,000 feet; this was the highest point at which any reptile was obtained, and only two specimens, both of the same species, were found.

Kamborangah was also rather a poor locality for invertebrates. Only one species of butterfly, (*Danaida crowleyi*), could be regarded as a resident; on a single occasion we saw at a distance two Pierines, one Lycaenid (possibly *Lycænopsis*), and one Hesperid (possibly *Hasora*). Moths were more plentiful, in greater variety, and with one possible exception, quite distinct from those obtained at Pakka: some of the Pyralidae and Tortricidae were found by day also resting on tree trunks.

With regard to the Orthoptera, about six species of Blattidae, all small in size, were collected under moss, or while moving about freely at night; a few specimens of an apparently semi-aquatic species were discovered under stones in the bed of the Kadamaian river at the bottom of the gorge below our camp. These should not rightly be included in this section as they were taken several hundred feet below the level of our camp. Four species of Acridiidae of which two belonged to the subfamily Acrydinae, and two to the genus *Erucius*, and two or three apterous species of Phasmidae were found in the immediate neighbourhood of our camp, several specimens of a *Rhaphidophora* species, similar to that at Pakka were collected, and one specimen of a *Euconocephalus*.

The Hemiptera were as follows: Pentatomidae (two species), Lygaeidae (one species), Aradidae (one specimen), Capsidae (three species), Cercopidae (seven species), Fulgoroidea (several species, including a few of the Delphacidae found commonly at Pakka), Jassidae and Psyllidae.

The flies were represented by more individuals and species than almost any other order; Nematocera were again predominant, though there was a decrease in the Fungus midges, and an increase in the Craneflies. Anisopodidae and Simuliidae were commoner than at Pakka as were small Chironomidae.

Mosquitoes, in spite of the large numbers hatching out in pitchers of *Nepenthes lowii* (mentioned above), were not at all troublesome; this seems to be the altitudinal limit of their range on the mountain.

In the other suborders, the ten species of Syrphidae included a long series of *Pseudovolucella fasciata* Curran, which were probably the adult form of the aforesaid "rat-tailed maggots," found in the sludge of the plant pitchers.

Empididae were found resting on the edges of large-leaved ferns around the camp site; they were often observed to dash in to flights of midges, seize a victim and fly back with it to the fern leaf, and on one occasion an Empid fly was caught in the act of devouring a small parasitic hymenopteron. Other families found at this altitude, sparingly, were—Dolichopodidae, Stratiomyidae (three species), Pipunculidae (one specimen), Leptidae (not common), Asilidae (one specimen, probably not resident), Ortalidae, Sepsidae, and Drosophilidae. Calyptrate

Muscaridae though common were not in very great variety; the *Calliphora* and *Servillia* taken at Pakka occurred here also.

The beetles were chiefly as follows—Carabidae (seven species), Staphylinidae (a few species but numerous individuals), Malacodermata (several species, one of which was scarce at Pakka, but most of the rest were taken later at Lumu Lumu and Marei Parei, at lower elevations), Rhipiceridae (scarce), Erotylidae (a single specimen), Cucujidae (one species), Elateridae (three species), Dascillidae (scarce), Chrysomelidae (several species), Longicornia (eight species), Tenebrionidae, Oedermeridae (one species), Anthicidae (one specimen), Scolytidae and Platypodidae, Melolonthinae, and Passalidae (two specimens). Species belonging to these two latter groups occurred more plentifully lower down the mountain; this appeared to be the altitudinal limit for Lamellicornia.

Small colonies of Embioptera (*Oligotoma* species) lived among the moss on the tree trunks both above (up to 7,500 feet) and below the camp; generally speaking the drier moss was preferred.

Hymenoptera consisted of several parasitic wasps, chiefly Ichneumonidae and the following Aculeates: *Eumenes* (rare), *Vespa bellicosa* (not seen above 7,500 feet), *Halictus* (rare), and *Apis indica.*

Very occasionally a cicada paid a brief visit to Kamborangah at dusk. We took the species at a later date further down the mountain at 5,500 feet.

At 8,000 feet a large bright coral-red leech was obtained, and at Kamborangah we collected earthworms and a few small land snails and slugs as at Pakka, but both groups were weak in species and individuals. Of the millipedes a flat species of Polydesmidae was especially noticeable though a number of other small species together with Isopods and Amphipods were common. Spiders and Opiliones were present and this was the highest point at which a scorpion was obtained and also the curious long-legged centipede, Scutigeridae. A land planarian was also found at this level.

It will be seen from the above that at Kamborangah we were very near the low level limit of species living in the higher mountain zone, and at the altitudinal limit of the lower mountain zone species.

We stayed at Kamborangah until April 6th when we moved down to Lumu Lumu. As soon as we started to pitch our camp here we attracted a large number of horse-flies (*Tabanus brunneus* Macq.) which settled on all light-coloured material: at night we were assailed by minute midges (*Ceratopogoninae*) against which even our fine-mesh sand-fly curtains were of no avail.

The site of our camp, at about 5,500 feet, was on a rather flat ridge which extended backwards for some distance, and there was an adequate stream providing a plentiful supply of excellent water for all purposes close at hand. In front of the camp lay the path to the mountain and beyond this the ground sloped fairly steeply. We were actually looking down the Minitindok gorge (upper part of the Kadamaian valley) towards Kiau.

The ground on which our tents were pitched was moss covered and in fact every tree and leaf was festooned with mossy growths, the whole locality being kept continually damp by mists and rain, (Plate III *b*).

The sun rarely shone on this place for more than an hour and a half to two hours a day and it was only by making drastic clearances that we could use the small amount of sunshine available for drying our specimens as we were now in tall forest. We both agreed that Lumu Lumu was the most unpleasant place we had ever camped on; to the gloomy, depressing, wet forest an ever-present danger of falling trees helped to create a feeling of uneasiness.

With the exception of *Rattus baluensis* which is almost certainly absent from this level in high forest, all the mammalian species obtained at Kamborangah were also collected at Lumu Lumu. *Rattus alticola* turned up again and as it occurs at Pakka its absence from the collections made at Kamborangah is no doubt due to the luck of collecting. Additional species also appeared for the first time in *Rattus whiteheadi*, a lowland form, here at its highest limit, *Rattus rapit* either a montane or submontane form, and *Sciurus orestes* a submontane form commoner at lower levels.

At Lumu Lumu many additional species of birds were obtained: lowland species occasionally stray to this altitude, and a number of the true montane forms are found commonly here but they seem to shun levels as high as Kamborangah, where possibly their natural food is scarcer. At this camp partridges appeared (*Arborophila erythrophrys* and *Haematortyx*) and we also got for the first time *Pyrotrogon whiteheadi* (the stomachs of which contained the remains of cicadas), *Artamides normani*, *Criniger ruficrissus*, *Dicaeum monticolum*, *Arachnothera juliae* etc.

Lumu Lumu was a good collecting ground for frogs, but lizards and snakes were still scarce. Tree-frogs were common on certain nights, especially on the flat ground near the camp, but the steep ridges and slopes were comparatively unproductive.

This locality was infinitely richer in insects than Kamborangah, though we were still rather high for many of the lower mountain zone species. None of the insects taken at Pakka was seen here, but most of the genera collected sparingly at Kamborangah occurred more plentifully or in greater variety at this lower elevation; several things such as Dragonflies, Cricket-locusts (*Gryllacris*), etc., were met with for the first time, being found at no higher altitudes. Only one small species of Agrionine dragonfly (*Coeliccia* sp.) was obtained, and several nymphs of an Aeschnine species inhabited the camp stream.

The local conditions were not suitable for butterflies though the hardy *Danaida crowleyi* was much commoner than at Kamborangah; the only other species taken was a *Melanitis.*

Large numbers of moths came to our lamps on still, moonless, nights: rain, drizzle, or mist under these circumstances seemed merely to stimulate their phototropism. The majority of the species captured were not found higher up the mountain, though a few of the moths common at Kamborangah were taken sparingly here at Lumu Lumu.

During our stay Geometridae were the most frequent visitors to our lamps and were strongly represented both in individuals and species. Of the Noctuidae, the genera *Carea* and *Stictoptera* were the most abundant, especially the former, but several subfamilies, for instance, Quadrifinae and Hypeninae, were not very prominent. The Arctiidae were not so common as on other parts of the mountain (notably Marei Parei spur), and only a few Pyralidae were taken. No day-flying moths were seen, though the genus *Milionia* which includes some day-flying species, visited our lamps on several occasions.

It appears as though moths flight above the tree tops at night, and if a strong light is placed at the top of a hill, or on the crest of a steep ridge with a good outlook over forest land, then there is every probability that numerous specimens will be attracted to tne lamp if conditions are favourable. The lamps we used were ordinary petrol mantle lights without any special adaptation for throwing a concentrated beam, and the results obtained were quite satisfactory.

The usual flighting time for moths is from about half an hour after sunset (roughly 7 p.m.) until 8.30 p.m., when there may be a pause before a smaller and later flight at about 10.30 p.m. The two flights may be well marked, but on some nights the number of moths flying into light may be so large that there is no well marked hiatus between the two impulses. Moths are on the move again an hour or so before sunrise, and with the exception of the day-flying species, have settled down by daybreak.

The more noticeable Orthoptera, in addition to the *Gryllacris* mentioned above (three species found only after dark), were seven species of Phasmidae, some of which were covered with spines resembling the mossy growths which festooned the leaves and trees around them. One of the larger species stridulated when captured by raising the apex of the abdomen in a threatening attitude, and rasping the short tegmina against the spiny basal tergite. One species of Tettigoniid, found more commonly at Kiau, one Mantis, and two species of Acridiid (one Acrydinae, and one *Systella*) completed our material in this order. The Embioptera which occurred at Kamborangah were found here also.

The Hemiptera were in greater variety and included Pentatomidae, Lygaeidae. Pyrrhocoridae, Reduviidae, Capsidae, and the following Homoptera: Cicadidae (found chiefly at dusk), Cercopidae, Fulgoridae and Jassidae.

The Coleoptera were more abundant and though most of the Kamborangah species were found here, there was a greater number not found at any higher elevations. The additional families included Coccinellidae, Endomychidae (rare), and Pyrochroidae.

In addition to the Diptera Nematocera and Calyptratae which were again numerous, the following families were prominent: Tabanidae, Syrphidae (seven species), Leptidae (several species of *Chrysopilus*), Dolichopodidae, Stratiomyidae, Lonchopteridae, Sepsidae, and Drosophilidae.

In the Hymenoptera, besides a number of parasitic wasps were the following: Tenthredinidae (one specimen), *Tiphia* (not common), Pompilidae (two species), *Trypoxylon* (one species), *Polybia rhaphigastra* (numerous), *Vespa dorylloides* (the widely-spread nocturnal wasp, usually attracted to light); this seemed to be highest limit for these two latter species, and *Vespa bellicosa*. A few species of ants were found, but they were not common.

Here we obtained for the first time on the mountain the large centipedes (Scolopendridae), usually so conspicuous in any zoological collection made in Malaysia, and pill-millipedes (*Oniscomorpha*). We also took *Opiliones*, Scutigeridae, and numbers of Isopoda, land-snails, slugs and leeches. The large earthworm found at Pakka turned up here again.

The absence of a greater variety of the typical lower mountain zone species may have been due partly to the remarkably damp situation of our collecting area.

On April 19th we left Lumu Lumu for Kiau in fine weather. Our path descended gradually, but there were a few uphill climbs to break the monotony, and at about 5,000 feet we passed another camping site equally damp as that we had just quitted.

So far as one could see, the mossy forest persisted, but was not quite continuous, until we were within a few hundred yards of the main bridle path which we reached after a walk of one hour and twenty minutes, arriving at Tenompok Pass a few minutes later. We both experienced extraordinary exhilaration on emerging into bright daylight after a spell of nearly five weeks in gloomy forest, and the effect of having a firm path underfoot in place of sodden, yielding vegetation, produced a sensation of well-being which was only dissipated during the latter stage of our journey to Kiau.

The day was cloudless and clear and we had excellent views of the summit from various aspects before the mists started to close in. Unfortunately the man who carried the camera had chosen a short cut, and by 11 a.m. the upper slopes of the mountain were obscured by clouds.

Butterflies, and certain day-flying moths (*Nyctemera, Deilemera, Abraxas*, etc.), were rather numerous all the way along the bridle-path, and as regards birds the handsome babbler, *Rhinocichla treacheri*, was as usual common; this bird is one of the most conspicuous denizens of the mountain. The voice consists of a very melodious series of whistles, the loud, penetrating notes, ringing incessantly through the forest.

We reached an insignificant track leading down from the bridle path to the Kadamaian river about one and three quarter hours after leaving Tenompok Pass. We descended warily owing to the hillside being steep and covered with loose, slippery stones, partly hidden by vegetation, and eventually arrived at the foot of the gorge by a rather different path than that by which we had ascended; after crossing the river by means of a bamboo bridge we commenced the climb to Kiau.

This was probably the worst part of our trip and the going was so heavy that we would advise future travellers to take extra time on the descent and to follow the bridle path round to Dallas. Perhaps the fact that we had spent more than a month in rarified atmosphere and were unaccustomed to the heavier air had something to do with the undue fatigue we experienced, and the difficulty in breathing from the exertion of climbing up a comparatively slight slope.

The route from Lumu Lumu to Kiau took about five hours. We reached the hut at Kiau soon after midday and settled down to dry our specimens, but first of course had to clear the immediate neighbourhood of village pigs. The Dusun pig is small and very black. Sometimes the "stockings" are white but none shewed the whitish head-stripe of the *vittatus* pigs. The muzzle is shorter than in the bearded pigs, and all statements concerning the occurrence of the common wild pig or "babi utan" in Borneo must be received with caution. Most sportsmen declare that the black and "white" pigs occur side by side in Borneo, the former representing a smaller species, but a few specimens of the former produced for us by sportsmen have always proved to be young *Sus barbatus*.

The next day (April 20th) was spent at Kiau in sorting out baggage and making preparations for further excursions on another part of the mountain. On April 21st we sent the collectors on ahead to pitch our camp near the head of the Kenokok (or Penokok) valley. Heavy rain fell from midday with thunder beyond the ridges and a beautiful double rainbow was seen in the evening stretching from Mt. Kinabalu on the left, over the Kadamaian valley to the bridle path on the right. A large volume of water must have fallen on the mountain as numerous waterfalls came tumbling over its false crest.

On the following morning, April 22nd, we left for Kenokok in bright sunny weather. On leaving Kiau, our way led over the ridge above the village and then descended into the Kenokok valley. Some magnificent views are to be had from the crest of this ridge.

Kenokok valley is, or has been quite recently, under cultivation by the Dusun inhabitants, and it is only near the head that there is still some untouched forest. We followed a small and very bad track up this valley, through the cultivated area, and forded a subsidiary torrent on entering the big forest. This consisted of tall trees and an undergrowth of aroids, ginger-worts, etc., all rather damp and reminding us of some typical lowland jungle in parts of the Malay Peninsula. We walked on a bit further and after climbing over another spur reached the left bank of the Kenokok river. Following this bank we came to a large rock and crept round its narrow ledge overhanging the river, and forded the river a few yards higher up. Then a short but steep climb took us to a flattish area of ground where we found our tents pitched in a small clearing.

The site of our camp was probably forty feet above the river and on its right bank. The land was gently undulating with a gradual rise towards the mountain. The jungle was excellent forest land and parts of it were comparatively free from undergrowth. There were several tracks leading through it, some probably game-tracks and others undoubtedly made by the Dusuns when foraging for jungle produce.

Much of the fauna here consisted of submontane and lowland forms which was rather peculiar in view of the fact that the situation of our camp was at an elevation of about 3,300 feet. It was assumed, however, that most of these species had been driven up, gradually, in consequence of the jungle felling and cultivation up to nearly 3,000 feet.

Kenokok was a very good collecting ground for all vertebrates and we obtained good series of mammals and birds. In the former a change is evident: *Rattus baluensis* is absent and is almost certainly restricted to higher levels, *Rattus ochraceiventer* replaces *R. alticola* and *Sciurus prevosti baluensis* is replaced by the lowland *Sc. p. pluto.* Other lowland species occur in *Rattus whiteheadi* (here very common), *R. surifer,* and *Ratufa,* but the very strong montane element persists in *Rattus infraluteus, R. rapit, Tupaia montana* (but not so common here as at higher levels), *Hylomys, Drymomys, Sciurus jentincki, Nannosciurus whiteheadi* and *Helictis* all of which we obtained. No example of *Dendrogale* was found.

The avifauna of Kenokok was still quite definitely that of the mountain, though we were too low for a number of species which were common at Kamborangah. It was the highest point at which we secured a number of forms including *Hemixus connectens,* but on the whole it showed very little of the lowland influence so marked at Kiau where the jungle has been much cleared.

Ten species of batrachian were collected with the aid of a lamp after dark within a hundred yards of the camp. Lizards and snakes were less common than at the lower levels of Kiau and its environs.

The insect fauna in this area was most interesting and was represented by many of the typical and widely spread lowland and submontane genera: there was a complete absence of the true high mountain zone species, and at Kenokok we were probably in the belt where the insect fauna on the mountain reaches its optimum.

To mention all the families of insects found here would serve little useful purpose until they have been worked out in detail, but the presence of the following genera: *Neopanorpa, Cicindela, Therates, Calobata, Melipona* (to mention only a few out of many), will shew what essentially lowland and submontane forms occurred.

The collections also include numbers of millipedes, centipedes, *Opiliones,* spiders (including the peculiar spined forms, Gasteracanthinae), a pedipalp, leeches, slugs, a beautiful land-planarian, and a species of fresh-water crab.

We left Kenokok for the Marei Parei spur, on the western slopes of the mountain, on the morning of April 27th. In order to save making a wide detour, we had a new trace cut from the north-west corner of our camp: this was followed and it was found to be easy going. We passed a vast trap for *Kijang* (Barking deer), which must have been more than a hundred yards in length, a short way from our camp. Our path then descended to the Dahobang river (at a point where a small tributary enters it on the right bank), and from there led up a steep ridge to the old Kiau—Marei Parei track at 3,700 feet which we met after about an hour's walk. Then we climbed for another five hundred feet, and later descended a steep ridge to the Kinataki river. On crossing this river there was another climb up a steep ridge at the top of which the vegetation became stunted: our path now led through several short defiles where there were pools of muddy water, and suddenly we found ourselves clear of jungle and into rather open, boulder-strewn country.

This is the Marei Parei spur (Plate I*b*), the name applying to a rather open, undulating area of ground which lies immediately below the western peaks of the mountain, in a direct line with Mount Nungkok.

We pitched our tents on some fairly flat ground where we had extensive views of the valleys below, and even the coast line from beyond the mouth of the Tampassuk river (north), to beyond Jesselton (west), though much of the view to the west was shut out by Mt. Nungkok, whose summit rose slightly above the level of our camp. By aneroid we were at an elevation of 5,000 feet.

The climate was delightful up to midday, but after this we could reckon upon having persistent and heavy rain until late at night.

The vegetation on the spur itself is scanty, speaking generally, and the trees, except in some of the sheltered gullies are rather stunted and sickly. *Leptospermum* is the predominant growth, though grasses, rushes, pandanus, a few orchids, pitcher-plants, and a kind of sundew are also common. With regard to the pitcher-plants, there were several clumps of the gigantic *Nepenthes rajah* growing in damp situations, generally near streams. Each pitcher contained sufficient liquid almost to fill a medium-sized enamel wash basin (or about two quarts), and in this lived innumerable culicine larvae (*Culex shebbearei* Barr.), a species which had been found on one previous occasion only—in a hollow tree in the eastern Himalayas! The sludge at the bottom of the receptacle harboured several "rat-tailed maggots" similar to those found at Kamborangah in *Nepenthes lowii*.

There was a track, consisting largely of mud and water, which led from our camp round the spur in a northerly direction to some gloomy forest about a quarter of a mile distant. At the back of our camp the ground rose at first gradually and then more steeply towards the mountain. For about three hundred feet the vegetation was very sparse and then there was a belt of mossy forest where the trees, not more than twelve to fifteen feet in height, were all rather slender and packed close together with bamboo and rattan interwoven.

At 5,500 feet there was a small area of flattish ground that had been used, undoubtedly, for camping at one time: there were indications that pig frequented this spot and rhinoceros tracks were numerous. Just above 5,600 feet we found the resting place of a sambhur deer that had been vacated quite recently. Above this point the hill rose very steeply and it was necessary to hack every inch of the way through thick, matted, growth; several game tracks were seen but these were partially obliterated by fallen trees. It appeared as though the tree limit ended pretty abruptly at somewhere about 8,000 feet, and towering above this are the bare, rather precipitous granite slopes. The only man to reach the summit from the Marei Parei spur so far is J. Peltzer, in 1879.

The soil on this part of the mountain is very poor and in many places consists merely of a shallow layer of slimy mud over rock. There are also numbers of little springs and streams which keep the ground in a perpetually saturated condition, so much so that we had to have a thick layer of the "heathery" *Leptospermum* on the floor of our tents in order to keep out of the slush.

It is interesting to note that Spenser St. John in his "Life in the Forests of Far East" (1863), drew attention to the fact that Marei Parei spur would be a suitable hill-station for troops "......if ever the north of Borneo falls into the hands of a European Power ......" The climate was ideal—up to midday, but it is probable that the weather conditions are more favourable during the later stages of the south-west monsoon, *i.e.*, June to October. An approach road might come in *via* Mt. Nungkok, and the water supply is plentiful. There is, however, little level ground suitable for building sites and the soil is unsuitable for cultivation, so it would mean introducing fresh material for that purpose: in fact the development of such a place would entail very considerable expenditure.

The boulder-strewn character of the country here certainly affected the composition of the mammalian fauna. *Rattus infraluteus* was not obtained but *R. baluensis* was common, although we could not catch it at the rather higher camp at Lumu Lumu, which was in dense forest.

Helictis is also absent from our collections which however contain all the other species obtained at the higher camps except *Sciurus orestes,* but the absence of tall trees no doubt accounts for this, and also for the comparative scarcity of *Sciurus jentincki,* so common elsewhere on the mountain.

The avifauna of Marei Parei is that of Kamborangah and Lumu Lumu rather than that of Kenokok: *Oreostictus leucops* and *Chlorocharis emiliae* were common.

This bleak, exposed place was a poor collecting ground for reptiles and batrachians.

The insect fauna was in many respects that of Kamborangah and Lumu Lumu (although a few species had been found at lower elevations also) whilst a certain number seen by us here were not found elsewhere on the mountain.

The vegetation, if any comparison can be made, recalled that on the exposed ridges above Kamborangah, and the occurrence of several higher mountain zone species at this level may be attributable to the fact that the tree-limit on this western side is much lower than on the south-western slopes: this, coupled with the rather uniform conditions due to the peculiar vegetation, and the *naturally* open character of the spur might tend to bring inhabitants of the higher mountain zone down to a lower level than they would occupy under normal circumstances.

Butterflies were commoner here than at any of the higher stations, but they seemed mostly to be passengers, travelling (often at a considerable height above the ground) from one part of the mountain to another, along several more or less well-defined "channels". They occasionally came down and settled for a brief period on some of the *Leptospermum* trees which were then in flower, and the only means of taking specimens was to mark down the trees which were most favoured in these "air passages" and to wait until a butterfly visited the blossoms. *Danaida crowleyi, Delias cinerascens, Appias whiteheadi* and *Lycænopsis* were the most noticeable.

It was nearly nine o'clock in the morning before the sun shone on this slope and stirred diurnal species into activity, so the collecting of them, on favourable days, was confined to a space of rather under three hours before the rain fell. Fortunately during our stay the conditions for night work were progressively profitable, and a catch of 300—500 specimens of moths during the first flight each evening was the rule.

Many of the commoner species had been taken already elsewhere, for instance at Lumu Lumu, but among several other things, Atlas moths (*Attacus*) were new to our mountain collections.

The miscellaneous collections made in this locality included Scutigeridae, millipedes, pill-millipedes, centipedes, spiders, land-snails, slugs, Amphipods, Isopods, and leeches.

On May 3rd we left Marei Parei and returned to Kiau. We descended to the Kinataki river (4,400 feet) and then climbed another ridge known as Penibukan and followed this down to the Dahobang river which we crossed. The trace from our camp at Kenokok met this path at about 3,700 feet, and after crossing the Dahobang there was a small spur to climb and this led into a lower part of the Kenokok valley where we passed through several clearings, cultivated plots and grass patches (very hot walking) until we reached the Kenokok river over which there was a shaky bamboo bridge. Our path then led up an exposed spur, kept along the top of it for a short distance, and then to another spur across a small gully, following along it we reached a blacksmith's "shop" where there was a smith hand-forging a parang. It was interesting to see that his very efficient "bellows" were nothing more than a pair of large bamboos inside which were pistons, worked from above by a small boy.

From here it was a short walk down to the halting bungalow at Kiau which we reached in about three and a half hours after leaving Marei Parci. During the afternoon we paid off our carriers, some of whom even at that hour had been drinking heavily, and redeemed our "chits" for specimens.

Following the usual custom, we made a present to the village next morning of an ox, rice, and also funds sufficient to provide all the inhabitants with liquid refreshment, and then withdrew to Koung leaving them to celebrate the occasion in their own way. The baggage and collectors (from whom we gathered that the previous night's party had been a great success) arrived next morning, and we moved on to Kabayau on May 6th.

Our original intention was to ascend the Pangataran valley from Kabayau to Melangkap, where John Whitehead had made such wonderful collections in 1887–8, though it appears that much of the original jungle has been cleared since his day. The continual flooded state of the Tampassuk river, which had to be crossed, prevented us from carrying out this project, as it would have been very unsafe to send loaded carriers across. The river came down in spate every day, like a millrace, so after the third day, as time was getting short, we decided to abandon the attempt, and continued to collect in the vicinity of Kabayau where mixed with the lowland fauna are a few submontane species including the two king-crows *Dicrurus borneensis* and *Dicrurus stigmatops*. The insects were nearly all typical lowland species.

On May 13th we left for Kota Belud as it was found that our stock of provisions was nearly exhausted and there was only sufficient for the needs of our men for another few days; so we left instructions for the collectors to follow in three days time, and started off with a few carriers. We reached Tamu Darat in three and a half hours, and finding an extremely noisy fair in progress decided to push on to Kota Belud which we reached within three hours after leaving Tamu Darat, the latter part of this walk being through flat, open, sunbaked, country.

The District Officer at Kota Belud, Mr. D. K. Ingle, very kindly invited us to his house and it is difficult to express sufficient thanks to him for his hospitality and especially for the kind way in which he looked after us as neither was very fit after our long spell on the mountain: one of us went down with a bout of fever almost immediately.

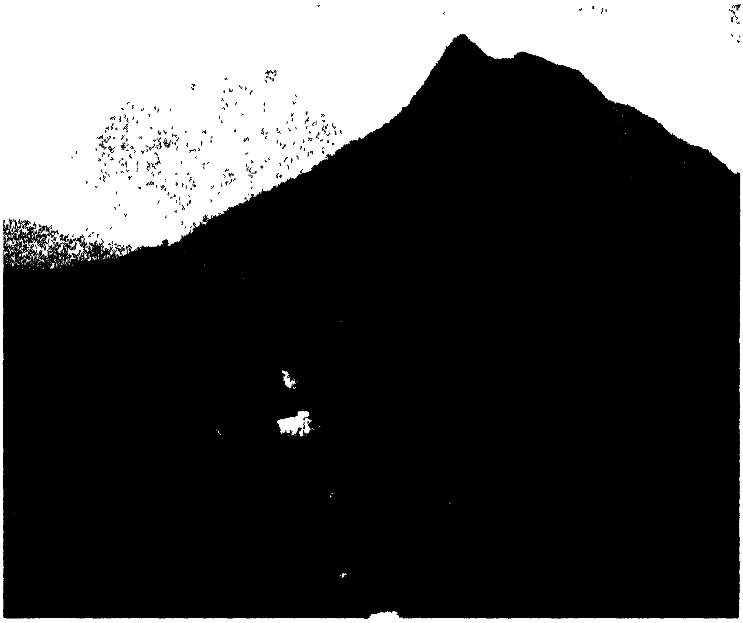
We stayed at Kota Belud until May 18th, the collectors and baggage leaving for Usukan Bay, about seven miles distant, in the morning, while we, accompanied by Mr. Ingle left at about 8.45 p.m.; it was a clear, very bright, moonlight night.

The sick man was carried on a long chair lashed to poles, and the pace taken from the chair-carriers was about two miles an hour; further carriers met us at the fifth mile when the pace was increased considerably. After crossing the ferry at Abai Abai the last half mile was covered quickly and we reached the Customs Sheds at Usukan Bay, where we slept, at midnight.

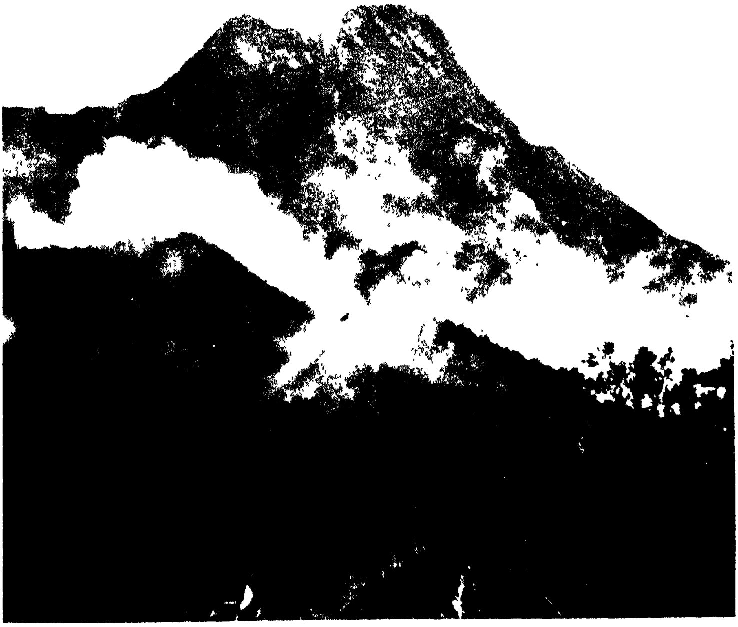
The coastal boat s.s. "Klias" called in at 5 a.m., and we sailed at 6.30 a.m., reaching Jesselton four hours later.

At Jesselton we enjoyed the hospitality of the Hon'ble Mr. C. F. C. Macaskie and left at about midnight on May 22nd by the m.v. "Marudu," reaching Labuan the next morning, Miri on the 24th, and Singapore during the afternoon of May 26th.

Although a few rather general inferences have been attempted in the body of this report, it is still too early to speak of the full results of our collecting trip: but these at least include the accumulation of the largest zoological collection so far made on the mountain, and perhaps in the highlands of Borneo. Preliminary investigation indicates that the percentage of novelties in the invertebrate groups is surprisingly high, but the discovery of many new forms may be regarded in itself as an unimportant result if the collections can be made to throw light on the curious distribution of some zoological groups in Malaysia; and in particular on the origin of various elements in the obviously "composite" fauna of Borneo.



a Mount Nungkok seen from the bridle path between Kabayau and Koung Mt Kinabalu in background



b. Marei Parei Spur (5,000 feet) below the western peaks of Mt. Kinabalu.

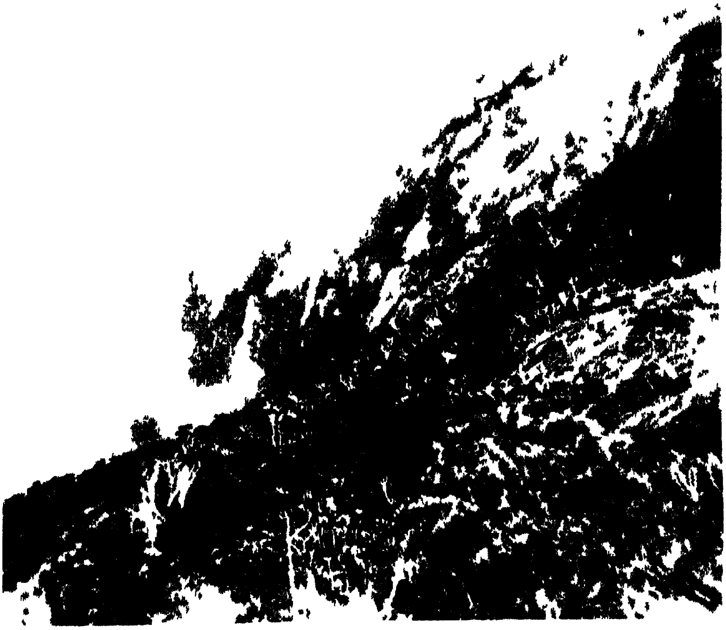
a Koung Village.

b. Dusun carriers at Koung village.

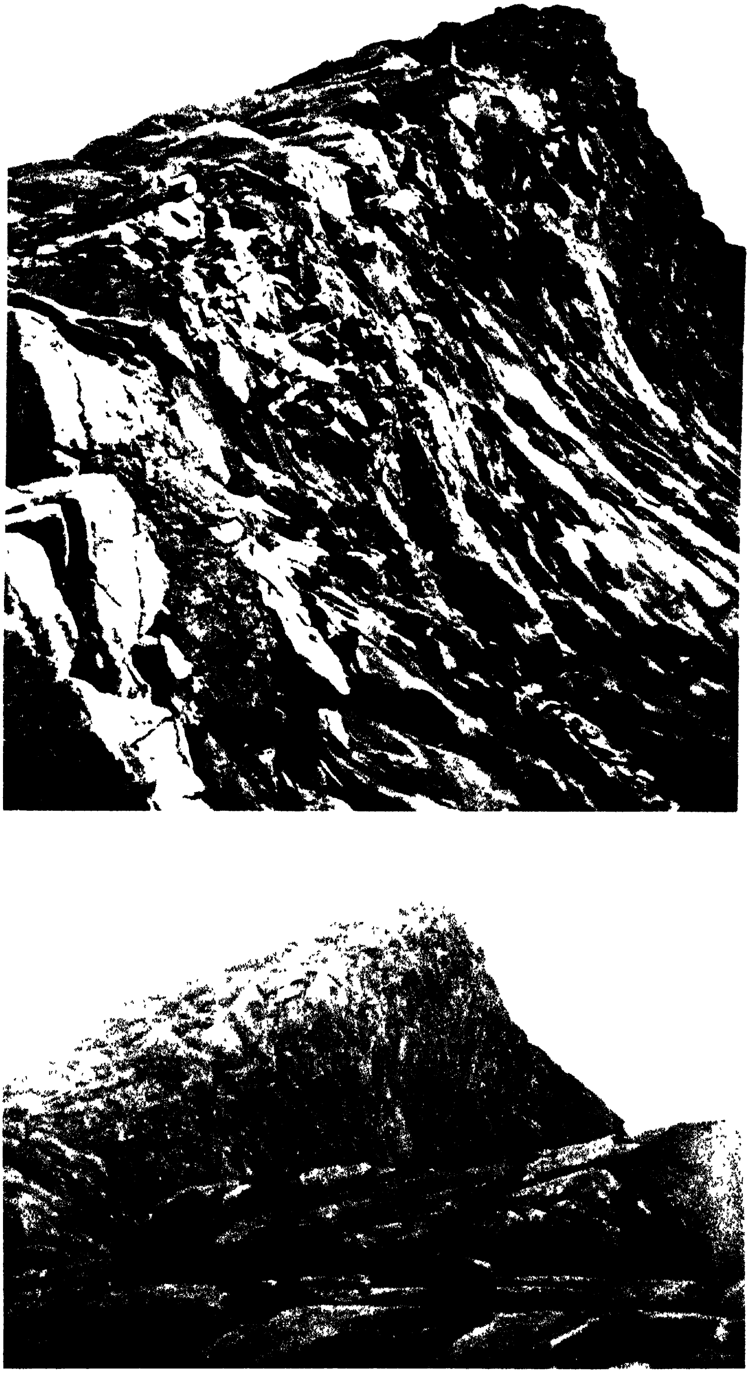
a. Camp at Pakka (10,200 feet). Pakka cave on the left.

b. Camp at Lumu Lumu (5,500 feet).

a. South summit slopes of Mt. Kinabalu seen from the tree limit. The slopes appear flattened as the camera was tilted to an angle of about 45 degrees.



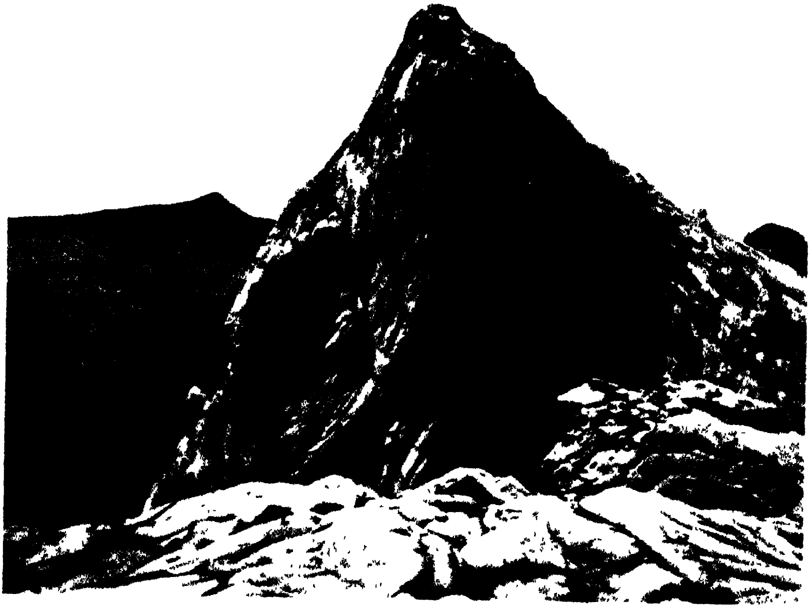
b. The south western slopes near the tree limit, 10,800 feet.



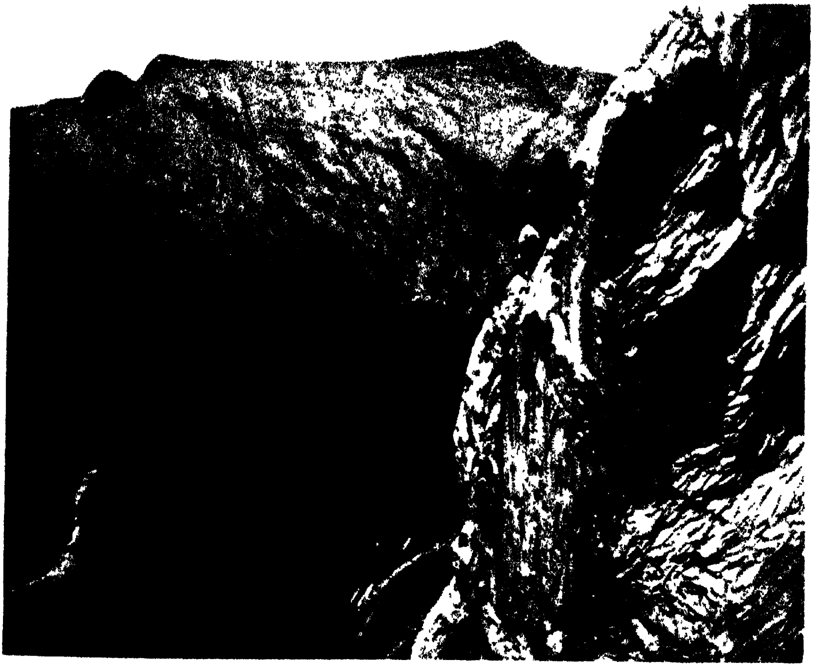
a. & *b* Two views of Low's Peak, 13,455 feet, the highest point on Mount Kinabalu.

a Harvey's Peak, 12,860 feet south of Low's Peak

b. Looking north east across Low's Abyss from the foot of Low's Peak.

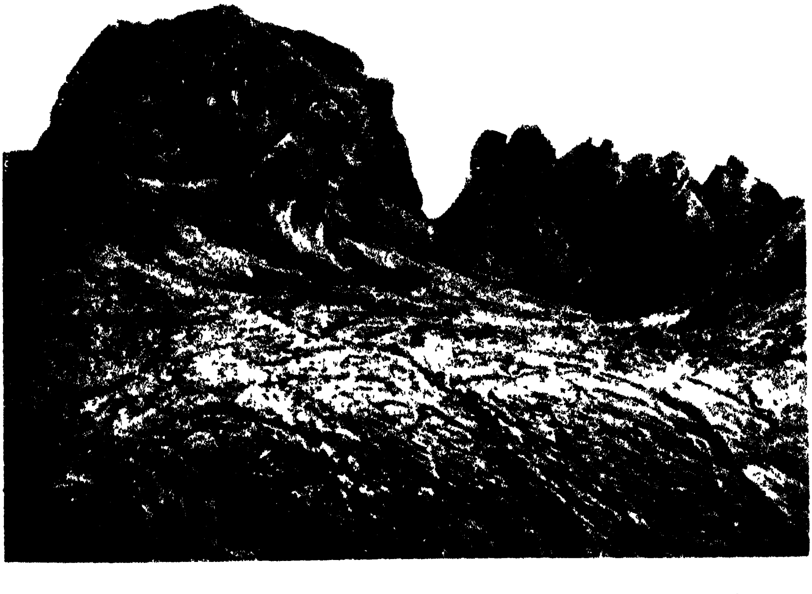


a. One of the peaks overlooking the abyss. On extreme right are two of the pinnacles seen from the tree limit (Plate IV).



b. Low's Abyss shewing King George Peak opposite

a Victoria Peak 13,450 feet



b Alexandra Peak, 13,135 feet, and serrations. The slope on the extreme right is part of Victoria Peak.

II. ON THE GEOMETRIDAE OF MOUNT KINABALU.

By LOUIS B. PROUT.

(Plates IX–XI.)

The truly remarkable collection of *Geometridae* made by Mr. H. M. Pendlebury on Mount Kinabalu was sent to me for determination and description and has proved abundantly to merit all the care and study which I have been able to bestow upon it. Of the extensive faunistic collections which it has been my privilege to work out systematically in the past, the three principal have been that made by Capt. Swann in Upper Burma (*Journ. Bomb. Nat. Hist. Soc.* xxxi), the Aigner Japanese collection in the Tring Museum (*Nov. Zool.* xxxv, No. 4) and the Alluaud and Jeannel collection from East Africa (*Mém. Soc. Zool. Fr.* xxix, No. 5). The Swann collection contained 330 species, that of Aigner 295, that of Alluaud and Jeannel 213. Swann and Aigner each collected over parts of two seasons; Alluaud and Jeannel, whose expedition, though undertaken under very different conditions, is the best comparable to that of Pendlebury and Chasen (see *Voy. de Ch. Alluaud et R. Jeannel en Afrique Orientale: Liste des Stations* p. 6 and map), obtained extremely important results in 6 months; but the palm must given to Mr. Pendlebury's achievement, over 270 species having been collected in less than 3 months. This—if I may repeat an Englishman's comparison which I made (*Nov. Zool.*, xxxv., 289) in estimating the probable Geometrid wealth of Takao-San in Japan—nearly equals the total for the British Isles. Very few species previously known from Kinabalu seem to have escaped Mr. Pendlebury; I have found in the Oberthür collection a form of *Eumelea rosalia* (Stoll, 1781), *Dooabia puncticostata* Prout (1923) and *Tanaorhinus rafflesi* (Moore, 1859) and have recently published a new species, *Hyposidra lactiflua* (*Nov. Zool.* xxxvii. 31) in order to be able to notice it in the present survey. I may have overlooked or forgotten a few others, but in any case the following pages furnish a tolerably complete account of the *Geometridae* as yet known from the locality.

A valuable account of the expedition is given (*antea*) by Messrs. Pendlebury and Chasen in this number of the "Journal" and the topographical detail is not repeated here excepting the approximate altitudes (corresponding to the printed labels) for the new species and subspecies; I have, however, added the words "near Kinabalu" to Kabayau wherever that is the sole recorded locality, lest otherwise its products should get quoted among the true mountain species. That the present memoir does not entirely bear out the conclusions arrived at by Robinson and Kloss with regard to the wide separation of the species of Kinabalu—sometimes even the genera—from those of other parts of Malaysia, is no doubt due in some measure to the more backward state of Geometrid systematics. In my recent faunistic studies I have repeatedly had occasion to deplore the inadequacy of the available material, as well as my own inability to use it to the best advantage; in so large and difficult a family, it has hitherto proved impossible for a small handful of workers to bring order out of disorder, and in very many cases the delimitation both of species and of natural genera is waiting upon closer morphological studies than any that have yet been made.

Notwithstanding this handicap, however, a glance at the collection is sufficient to show how strikingly distinct are many of the new species and forms obtained. I have not, indeed, found it necessary to erect any new genera, though some rather isolated structure-groups within existing genera have been found, and a few anomalous forms which, on further revision, may probably be found genetically remote enough to demand such treatment.

Many of the points of interest are dealt with under the separate species, or are omitted as calling for further investigation; but reference may here be made to a few. The *Oenochrominae* require little comment; 4 out of the 11 are lowland species picked up at Kabayau during the single day's collecting there (12th, May). The same is true of 10 of the 38 *Hemitheinae*; *Thalassodes* is rather well represented, otherwise the species are distributed over a considerable variety of genera, with *Diplodesma stictogramma* as the most striking novelty. Of the *Sterrhinae* a good half are *Anisodes*, unfortunately largely ♀ ♀ and very difficult, but including a new structure-section (or subsection of *Pisoraca*) in No. 55; the fewness of *Scopula* and *Sterrha* species is rather remarkable.[*] The *Larentiinae*—conformably to the generalization which I have more than once made elsewhere—came exclusively from the mountain and yield many important novelties. Especial mention may be made of the *Micromia* subgenera, which were formerly supposed to be endemic to New Guinea; also of the specialized new *Phthonoloba* and indeed of the ample representation of the *Sauris* group in general and the specialized sections of *Chloroclystis*. In several cases where material is meagre I have been somewhat conservative in my determinations; probably in reality the number of new subspecies, perhaps even of new species, is decidedly larger than my catalogue has shown it. In the heterogeneous subfamily *Geometrinae* there are also striking new species, a few of them–particularly those referred provisionally to *Xenostega* and *Arctoscelia*–of more or less uncertain systematic position; true *Arctoscelia* seems to be confined to the Philippines. The new *Milionia* and the new *Platycerota* are also nearer to Philippine species than to any thing known heretofore. The genera *Platycerota, Gasterocome, Dasyboarmia* and *Necyopa* are new for Borneo, but not unexpected.

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[*] *Scopula* and *Sterrha* are not common in primeval forest. They prefer open country, especially cultivated areas, either in the plains or on hill stations. H.M.P.

The types, according to the invariable and highly commendable custom of the Federated Malay States Museums have been presented to the British Museum and a very generous gift of duplicates, including many paratypes, has been made to my own collection. Naturally, some specimens are in poor condition–occasionally too poor for even a provisional determination; but all have been well collected and most are in highly satisfactory condition.

Three very successful photographic plates have been prepared under the direction of Mr. W. H. T. Tams, by permission of the Trustees of the British Museum, and give representations of nearly all the described new species and the most outstanding of the races. Only the new *Amblychia* which is distinguished chiefly by a structural character, one new species in *Hyposidra* and one in *Ectropis*, which were worked out too late for inclusion, are omitted. All the figured specimens are the holotypes, with the exception of Pl. IX, fig. 2 and Pl. X, fig. 10, which are taken from the allotypes (♀).

Subfam. OENOCHROMINAE.

1. **Sarcinodes aequilinearia** (Walk.)

Mergana aequilinearia Walk. xxi. 292 (1860) (Sylhet).

Lumu Lumu, a large ♀.

Should probably represent a new race, or even–like *luzonensis* Wileman and South (1917)–a close relative of this species, which belongs to the Himalayas and W. China.

2. **Eumelea ludovicata** Guen.

Spec. Gén. Lép. ix. 393 (1858) (Ceylon).

Kabayau, near Kinabalu, 1 ♂.

The working-out of the races of this, the most widely distributed and one of the most inconstant of the *Eumelea*, has only just commenced, so far as it concerns those found westward of Celebes, which differ only in very slight and often unstable details. See *Nov. Zool.* xxxvii. 2.

3. **Eumelea rubrifusa** Warr.

Eumelea ludovicata rubrifusa Warr., *Nov. Zool.* iii. 358 (1896) (**Kinabalu**).

Kiau, 1 ♂.

The altitude is not given for Warren's type, nor for a fine series in the Oberthür collection obtained by Waterstradt on Kinabalu, but I imagine it is exclusively a mountain species.

4. **Eumelea florinata** Guen.

Spec. Gén. Lép. ix. 392 (1858) (Java).

Kabayau, near Kinabalu, 4 ♂♂.

I have records of this from Nias, Batu, Sumatra, Natuna, Borneo, Java and Lombok. In *Seitz* (xii. 32), on account of the apparent identity of the genitalia, I treated both this and *feliciata* Guen. as races of *vulpenaria* Stoll, but as their range seems to overlap this can hardly be correct. I believe constant, though very slight, differences may be found in the structure of the ♂ hindleg.

5. **Eumelea semirosea rosans** subsp. n.

Kiau, 1 ♀.

As the specimen has lost its hindlegs and good material of the form (which was mentioned, without description, in *Treubia* vii. 429 and *Nov. Zool.* xxxvii. 4) exists elsewhere, I have not made it the type, but describe the form below.

♂. Rather more uniformly rosy than *S. semirosea* Warr. (1897), the yellow admixture rather weak, but more regularly distributed than even in *S. phoenissa* Warr. (1905); lines generally slender, antemedian often well expressed, postmedian rather more anterior than in the Moluccan races. ♀ probably dimorphic, the allotype yellow with postmedian greyer than in the corresponding ♀♀ of the other races.

Kinabalu, several ♂♂, 1 ♀; type in Museum Tring.

6. **Derambila zincaria** (Guen.)

Zanclopteryx zincaria Guen., *Spec. Gén. Lép.* x. 16 (1858) (Sarawak).

Kabayau, near Kinabalu, 1 ♂.

A fairly common species, Borneo, Penang, S. Philippines, Sulu, Celebes, Bangkei, and in the form *permensata* Walk., running through the Lesser Sunda Islands to N. Australia.

7. **Alex palparia** (Walk.)

Panagra palparia Walk. xxiii. 988 (1861) (India).

Lumu Lumu, 1 ♀; Marei Parei, 1 ♀.

Distributed from India to Siam, Borneo, Java and Bali.

8. **Ozola impedita** (Walk.)

Acidalia impedita Walk. xxiii 766 (1861) (Sarawak).

Kabayau, near Kinabalu, 12 May, 1 ♀.

The specimen is very weakly marked, but I take it to belong to this Sarawak species, of which the better known

North Indian *biangulifera* (Moore, 1888) is probably a separable race.

9. **Ozola extersaria** (Walk.)

Macaria extersaria Walk. xxiii. 966 (1861) (India).

Marei Parei, 1 ♀.

This species, which in 1921 (*Seitz* xii. 40) I only recorded from N. India and Hainan, is now known to me also from the Malay Peninsula, Siam, Tonkin and Borneo.

10. **Ozola falcipennis apiletica** subsp. n.

♂ ♀. Blackish maculation in general heavier than in *O. f. falcipennis* (Moore, 1888, Khasis), the distal band of the forewing as a rule broadened, reducing the white terminal spot of cellule 3; the postmedian spot behind M^2 of the forewing more proximally placed and much enlarged, reaching hindmargin, in the ♀ ♀ as a rule anteriorly connected or confluent with the antemedian (subbasal) band.

A large ♀ has been chosen as holotype; the only ♂ is badly torn and though it may safely be assumed to belong here its wing-shape cannot be made out; but since it and one ♀ (also unfortunately torn) are considerably smaller than the rest of the series it is just conceivable that it may prove to represent another species in this rapidly widening assemblage.

A single ♀ from Sarawak, certainly belonging to the new race, and another from Mt. Tahan, in some measure intermediate, have been known to me for many years, but I had not ventured to deal with them, so much the less because the abundant Khasi material known to me is exclusively male.

11. **Ozola pantomima** sp. n. (Pl. XI, fig. 13).

♂ ♀, 36–37 mm. Very similar to *falcipennis*, on an average a little smaller. Readily distinguished as follows.

Hindtibia of ♂ much more broadly dilated and hollowed (about as in *indefensa* Warr. 1899, *pica* Wileman, 1921, etc.) *Forewing* with apex less falcate, termen less sinuous, costal edge often blackened, (at least in its greater part) instead of strigulated; subbasal band a little less oblique posteriorly terminal band at hindmargin broader or bipartite, subapically not containing any white spot, about base of R^3 confluent with the cell-spot. *Hindwing* with the spots at abdominal margin differently placed. Abdominal spots on the whole stronger, more confluent into belts.

Marei Parei, 5,000 feet, 29 April–2 May, 1 ♂, 3 ♀ ♀.

The ♀ ♀, as in several *Ozola* are less narrow-winged and have the maculation heavier than in the ♂, but the differentiation has been drawn up so as to cover both. In two of the ♀♀ the subterminal band of the hindwing is almost complete, though in cellule 3 extremely attenuated and incurved.

It should be added that *falcipennis* has been chosen for comparison as the only generally accessible species of the group; actually, *pantomima* is nearer to *apparata* Prout (1928, Sumatra).

Subfam. **HEMITHEINAE.**

12. **Archaeobalbis urapteraria (Walk.)**

Hypochroma urapteraria Walk. xxi. 438 (Borneo).

Lumu Lumu, 1 ♂.

Known from Nias, Sumatra, the Malay Peninsula, Java and the Natuna Islands, apparently with some geographical variation.

13. **Archaeobalbis subtepens** (Walk.)

Hypochroma subtepens Walk. xxi. 438 (Borneo).

Kabayau, near Kinabalu, 1 ♂.

Rare elsewhere than in Borneo, but has been recorded from Penang, N. India and Ceylon.

14. **Pingasa ruginaria** (Guen.)

Hypochroma ruginaria Guen., *Spec. Gén. Lép.* ix. 278 (1858) (N. India).

Kabayau, 2 ♂♂; Marei Parei, 1 ♂.

Very widely distributed, see *Seitz* xii. 48; Tonkin, Formosa and doubtless S. China are to be added.

15. **Terpna erionoma albicomitata** Prout.

Seitz Macrolep. xii. 56 (1927) (S. W. Sumatra).

Kabayau, 2 ♂♂; Lumu Lumu, 2 ♂♂.

Also known from Selangor, F.M.S.

16. **Terpna tenuilinea** Warr.

Nov. Zool. vi. 19 (1899) (Sumbawa).

Kabayau, near Kinabalu, 1 ♀.

I do not think the cited type-locality is open to challenge, but subsequent material (still scanty) has been from Borneo, Sumatra and perhaps the Malay Peninsula. It is probable, however, that it is merely a race of *funebrosa* Warr. (1896, Khasis) and that it will be met with in many further localities.

17. **Terpna vigens ruficoloraria** Warr.

Nov. Zool. iv. 32 (1897) (Kinabalu).

Lumu Lumu, 4 ♂♂, 1 ♀.

Other known localities are Mt. Murud (*Sar. Mus.* Journ. iii. 172), Pahang, Selangor, Penang and Sumatra, and, I regard it as a race of *vigens* (Butl. 1880) from the N. E. Himalayas.

18. **Dindica alaopis** sp. n. (Pl. IX, fig. 9).

♂, 48 mm. Closely related to the typical, yellow-hindwinged group (*polyphænaria* Guen., 1858, etc.). Antennal pectinations rather longer than in *polyphænaria*.

Forewing with termen slightly less oblique anteriorly than in *polyphænaria;* strongly mottled, but with no pronounced red-brown admixture, no definite dark markings; an ill-defined pale subbasal stripe (absence of dark mottlings); apical spot similarly pale (rather more sharply than in *polyphænaria*), the fragmentary dentate subterminal line at least as white as in *para* Swinh.; a faint suggestion of an oblique band herefrom. *Hindwing* not quite so elongate or gibbous as in *polyphænaria;* apricot yellow or light cadmium, the border narrowed much as in not very extreme *para*, but with a good deal of reddish suffusion where it meets the ground-colour.

Underside at once distinguished from that of the allies by the reduction of the large cell-spot of the forewing to a fine and ill-developed streak on D C; no white patch between this and outer band; the latter rather narrow, on hindwing mainly blackish, on forewing more rufescent, only blackened on its proximal edge, at least anteriorly.

Lumu Lumu, 5,500 feet, 8 and 15 April, 2 ♂♂.

19. **Dysphania subrepleta** (Walk.)

Euschema subrepleta Walk. ii. 406 (1854) (Borneo).

Kabayau, near Kinabalu, 1 ♂.

A common species, widely distributed in the Malayan subregion and to Sikkim and Hainan, in various races.

20. **Dysphania discalis** (Walk.)

Euschema discalis Walk. ii. 407 (1854) (Penang).

Kiau, 1 ♂.

Sumatra to Borneo, comparatively rare.

21. **Dysphania transducta** (Walk.)

Euschema transducta Walk., *Journ. Linn. Soc. Zool.* vi. 94 (1861) (Borneo).

Kabayau, 1 ♀; Kiau, 1 ♀.

Common and in some localities variable, Nias and the Mentawi Islands to Borneo.

22. **Agathia succedanea** Warr.

Nov. Zool. iv. 388 (1897) (Kinabalu).

Marei Parei, 1 ♀.

Further known to me from Perak.

23. **Agathia hilarata latilimes** Prout.

Nov. Zool. xxiii. 200 (1916) (Java).

Kabayau, near Kinabalu, 1 ♂.

A. hilarata Guen. (1858) was described from India; the Malayan race is distributed in the Peninsula and the Greater Sunda Islands.

24. **Hipparchus** sp.

Marei Parei, 1 ♀.

Very much torn (especially the hindwing) and discoloured to yellow; perhaps near *xeromeris* Prout in Seitz (*Macrolep.* xii, in the press).

25. **Chloromachia divapala** (Walk).

Comibaena divapala Walk. xxii. 565 (1861) (Ceylon).

Kabayau, near Kinabalu, 1 ♀.

If the Malayan form proves racially separable, the name of *albisparsa* (Walk. xxii. 600, Sarawak) is available for it.

26. **Lophomachia discipennata** (Walk.)

Thalera discipennata Walk. xxii. 600 (1861) (Sarawak).

Kabayau, near Kinabalu, 1 ♂, very small.

Besides Borneo the species, which seems nowhere common, is known from Selangor, F.M.S., and E. Java.

27. **Lophomachia semialba** (Walk.)

Thalera semialba Walk. xxii. 601 (1861) (Sarawak).

Kabayau, 1 ♂; Lumu Lumu, 1 ♂.

Range similar to that of *Chloromachia divapala*, geographical variation more decided.

28. **Osteosema discata** (Warr.)

Chlorostrota discata Warr., *Nov. Zool.* iv. 389 (1897) (Kinabalu).

Marei Parei, 3 ♂♂; Lumu Lumu, 2 ♂♂.

These specimens are considerably smaller than Warren's type ♀ (altitude not indicated), which for many years remained the only known example of the species. Latterly Mr. A. E. Wileman collected on Luzon a few examples which I am treating as a separate race and only a few years ago Dr. Mjöberg discovered the name-typical form on Mt. Murud, Sarawak (see *Sar. Mus. Journ.* iii. 172).

29. **Rhomborista (Spaniocentra) megaspilaria** (Guen.)

Phorodesma megaspilaria Guen., *Spec. Gén. Lép.* ix. 371 (1858) (Sarawak).

Marei Parei, 3 ♂♂, 1 ♀.

Known also from the Malay Peninsula and Java, perhaps also India.

30. **Argyrocosma phrixopa strepens** subsp. n. (Pl. XI, fig. 7).

♂, 24 mm. Both wings with the white strigulation much slighter and less distributed than in *A. p. phrixopa* (Meyr., 1897), forewing with white antemedian spot at hindmargin and series of postmedian dots on the veins well developed, receding on SC^5 to a larger costal dot; both wings with white terminal dots well developed and the cell-spot enlarged.

Kabayau, 600 feet, near Kinabalu, 12 May, 1 ♂.

The face is white below, but the separation of the four white corner-spots, as indicated by Warren (*Nov. Zool.* iv. 390) is apparently rather inconstant in *phrixopa* (= *albipunctata* Warr.) and should not be stressed.

The name-typical race inhabits Java, Sambawa, Sumba, Adonara and possibly Buru, a closely related form in Queensland.

31. **Comibaena attenuata** (Warr.)

Probolosceles attenuata Warr., *Nov. Zool.* iii. 369 (1896) (N. Borneo: Mt. Mulu).

Kabayau, near Kinabalu, 1 ♂.

Extends to the Malay Peninsula, Philippines, Celebes and perhaps Java.

32. **Gelasma hemitheioides marculenta** Prout.

Seitz Macrolep. xii (in the press) (Kinabalu).

Marei Parei, 2 ♀♀; Lumu Lumu, 1 ♀.

The type is a ♂ in the British Museum, ex coll. Oberthür, collected by J. Waterstradt.

33. **Gelasma bifasciata** (Walk.)

Thalassodes bifasciata Walk. xxvi. 1562 (1862) (Sylhet).

Kiau to Tenompok, 3,000–4,500 feet, 1 ♀.

I believe that *bifasciata* will prove a species distinct from *thetydaria* Guen., to which it has generally been sunk. The specimen here recorded should represent a race but is inadequate for any decision.

34. **Thalassodes quadraria** Guen.

Spec. Gén. Lép. ix. 360 (1858) (? Central India; ? Australia).

Lumu Lumu, 1 ♂.

Apparently a large form of the species to which the above name is provisionally applied, but much uncertainty overhangs the group, the more so as Guenée's type appears to be lost. The present species seems to be Malayan in the broader sense and to straggle into Celebes and Formosa.

35. **Thalassodes veraria** Guen.

Spec. Gén. Lép. ix. 360 (1858) (? Australia).

Marei Parei, a few specimens; Pakka 10,200 feet, 1 ♀.

Similar difficulties concern this determination, at least pending a study of the type, which is said to be in bad condition. Moreover I cannot record the exact numbers of specimens of the present species and *curiosa* from Marei Parei, as 7 papered specimens which were not critically studied proved to embrace both.

By "*veraria* Guen." is here understood a widely distributed Malayan-Moluccan species with probable races in New Guinea, etc., and represented in India by *aucta* Prout (1912).

36. **Thalassodes curiosa** Swinh.
Tr. Ent. Soc. Lond. p. 673 (1902) (Penang).
Marei Parei, a few specimens (cf. *veraria*); Lumu Lumu 1 ♂, 1 ♀, in bad condition.

Possibly a race. Forms which agree in structure and in scheme of markings spread from Assam to the Bismarck Archipelago.

37. **Thalassodes hypocrites** Prout.
Gen. Ins. cxxix. 153 (1912) (Singapore).
Marei Parei, 1 ♂, ? 1 ♀.

New for Borneo. But if *viriata* Prout (1922, Ceram) is really, as I have assumed, a race, considerable extensions of its known range may be expected. The Malay Peninsula appears to be its head-quarters, but N. India and Sumatra have already yielded it.

38. **Thalassodes** sp.
Marei Parei, 1 ♂, 1 ♀.

Between *leucoceraca* Prout (1925) and *floccosa* Prout (1917), unfortunately too poor to describe.

39. **Thalassodes viridifascia** Swinh.
Ann. Mag. Nat. Hist. (8) i. 66 (1908) (N. Borneo).
Kamborangah, 1 ♂.

Very few examples are yet known.

40. **Prasinocyma floresaria** (Walk.)
Geometra floresaria Walk. xxxv. 1604 (1866) (Flores).
Kabayau, near Kinabalu, 1 ♀.

I have recently (*Nov. Zool.* xxxvii. 6) called attention to the very wide distribution of this species and the complete inadequacy of the material, up to the present, for working it out.

41. **Oenospila strix** (Butl.)
Racheospila strix Butl., Ill. Het. vii. 105, t. 136, f. 8 (1889) (N. W. India).
Marei Parei, 1 ♂, 2 ♀ ♀; Lumu Lumu, 1 ♀.

Hitherto only known from N. India. The Kinabalu specimens perhaps represent a race, rather strongly marked, but the differences seem so slight that I defer judgment.

42. **Hemithea insularia** Guen.
Spec. Gén. Lép. ix. 385 (1858) (Borneo).
Marei Parei, 1 ♀; Lumu Lumu, 1 ♀.

Another worn ♀ from Marei Parei, evidently a *Hemithea*, may likewise belong here.

Similar forms are distributed in the Malaysian subregion.

43. **Diplodesma stictogramma** sp. n. (Pl. XI, fig. 22).

♂ ♀, 28–31 mm. Face green. Palpus green, paler beneath. Vertex white, occiput green, a dark olive-brown line dividing the two colours. Antennal ciliation of ♂ about 1. Thorax and abdomen green above, whitish beneath. Foreleg partly infuscated on innerside; hindtibia of ♂ not dilated.

Forewing with termen in the ♂ almost straight; SC^2 stalked to beyond SC, M^1 connate or very shortly stalked; pale green, little brighter than "deep olive-buff" of Ridgway (probably when bred light yellowish olive or even brighter); costal edge very finely dark or dark-dotted; lines in the ♂ olive-brown, marked with blacker dots on the veins, in the ♀ scarcely indicated except by vein-dots; no terminal line. *Hindwing* with the postmedian only.

Underside paler, especially the hindwing; forewing with broad and rather heavy dark suffusion costally except at extremity extending as weaker suffusion across the cell.

Kamborangah, 7200 feet, 30 March—4 April, 2 ♂ ♂, 4 ♀ ♀.

Belongs to Sect. IV of the genus, nearer to *subexpressa* Walk. (1861) than to *xanthochlora* Swinh. (1894), but very distinct from all known species in its markings and its larger size.

44. **Paramaxates vagata** (Walk.)

Macaria vagata Walk. xxiii. 927 (1861) (India).

Marei Parei, 1 ♀.

Range: N. India, Tonkin, Selangor F.M.S., N. Borneo, Sumatra, W. Java.

45. **Iodis** (?) sp.

Lumu Lumu, 1 ♀.

Probably new, but discoloured and anomalous. The wing-markings and the venation appear absolutely *Iodis*, but the 3rd. joint of the palpus is relatively short and the abdomen seems to have been *Hemithea*-like; costa of forewing heavily dark-dotted.

46. **Comostola meritaria** (Walk.)

Geometra meritaria Walk. xxii. 522 (1861) (Ceylon).

Marei Parei, 3 ♀ ♀; Lumu, 1 ♂, 1 ♀.

Possibly a race, but the species, founded on a ♀, is still imperfectly known. Besides Borneo, single specimens which seem referable here have been taken in Upper Assam and on Tambora (Sambawa).

forewing brighter and more extended, followed posteriorly by a blackish hindmarginal patch, the hindwing blackish to just beyond middle, then rosy, the yellow border a little broader than in the type.

54. **Gnamptoloma aventiaria** (Guen.)

Timandra aventiaria Guen., *Spec. Gén. Lép.* x. 3 (1858) (Australia).

Marei Parei, 1 ♂.

Very generally distributed from India to Formosa, the Philippines, New Guinea and its islands, and Australia.

55. **Anisodes (Pisoraca) hirtipalpis** sp. n. (Pl. X, fig. 11).

♂, 34–37 mm. Face red, very narrowly pale beneath. Palpus reddish, over 2, 2nd joint with long forward-directed hair, reaching about to the end of the 3rd joint, which is longer than the 2nd. Head and body nearly concolorous with wings, vertex and base of antenna a little paler, end of abdomen conspicuously pale. Hindleg smooth, tibia with 3 spurs, the proximal one placed only a little beyond middle.

Forewing with areole narrow, fairly long, SC⁵ from its apex or very nearly; colour slightly more reddish than sayal-brown, but rendered indefinite by a dense overlaying of specialized scaling of a more drab tone; lines rather darker, thick, sinuous, postmedian scarcely traceable anteriorly; terminal dots wanting. *Hindwing* concolorous, less pilose, lines slightly less indefinite; a large buff cell-spot; terminal dots faintly indicated.

Underside smooth, rather pale pinkish buff; forewing more or less flushed with deep vinaceous, except at termen and hindmargin, postmedian indicated; hindwing paler, more weakly flushed, with a postmedian line and indications of subterminal shade, the cell-spot also indicated, pale.

♀ Similar, except for the sexual characters and (probably inconstant) obsolescence of the cell-spot of the hindwing.

Lumu Lumu, 5.500 feet, 8–11 April and 5 May, 7 ♂♂, 1 ♀, including the holotype; Marei Parei, 5,000 feet, 2 ♀♀; Kamborangah, 7.200 feet, 2 ♂♂, ♀♀, including the allotype.

56. **Anisodes alienaria** Walk.

List. Lep. Ins. xxvi. 1586 (1862) (sine loc.).

Marei Parei, 1 ♂.

Best known from Malay Peninsula. I have recently (*Nov. Zool.* xxxvii. 7) referred here, with a query, a ♀ from Siberut I.

57. **Anisodes absconditaria** Walk. (?).

List. Lep. Ins. xxvi. 1580 (1862) (S. India).

Marei Parei, 1 ♂.

The specimen is somewhat aberrant and only conjecturally placed here. The range of *A. absconditaria* is fairly extensive—India to Formosa, Malay Peninsula. Borneo, Sumatra and Java, with a race (?) in Szechuan.

58. **Anisodes posticamplum expunctor** subsp. n. (Pl. XI, fig. 17).

♂. Forewing with the posterior lobe a little fuller than in *p. posticamplum* (Swinh., 1892, Khasis, as *Streptopteron*), hindwing slightly better rounded between R^3 and tornus. Ground-colour slightly paler, median shade of forewing better developed, but with the characteristic dark postmedian mark obsolete, postmedian dots strengthened.

Kenokok, 3,300 feet, 23 April, 1 ♂.

A ♀ from Lumu Lumu, 5,500 feet, 13 April, both above and beneath with just the same tone and markings as the ♂, must surely belong here and is interesting as being the first *posticamplum* ♀ known to me; the wing-shape is of course that of normal *Anisodes*.

59. **Anisodes** sp.

Lumu Lumu, 1 ♀.

Probably near *confiniscripta* Warr. (1896) and *intermixtaria* Swinh. (1892), too poor to describe.

60. **Anisodes interpulsata** Walk.

List. Lep. Ins. xxii. 612 (1861) (India).

Mare: Parei, 5 ♀♀; Lumu Lumu, 2 ♀♀.

Previously known from N. India and (in a perhaps more ochreous-tinted race) the Malay Peninsula.

61. **Anisodes flavissima** (Warr.)

Perixera (?) *flavissima* Warr., *Nov. Zool.* xiv. 143 (1907) (British New Guinea).

Marei Parei, 1 ♀; Lumu Lumu, 2 ♀♀: Kamborangah, 2 ♀♀.

Agree well with the forms from Dutch and British New Guinea, the only hitherto known localities.

62. **Anisodes** sp.

Lumu Lumu, 11 April, 1 ♂.

Near *intermixtaria* Swinh. (1892), the palpus similarly long, the hindleg similarly glabrous and 2-spurred. areole—as in that species—rather small, with the subcostals stalked beyond. Rather larger (33 mm); pectinations continued to somewhat nearer apex of antennae; vertex paler, with a fine red line behind (in *intermixtaria* unicolorous); cell-mark ocellated on fore- as well as on hindwing.

I think the foregoing notes should render this species recognizable, but it is so much wasted that I have reluctantly decided against making it a type. Several ♀♀ (Lumu Lumu, 2 or 3; Marei Parei, 5) which probably—or some of them at least—may belong with it are also more or less defective, and in any case are not available as types; a few are curiously mottled, recalling some of the forms of *frenaria* Guen. (1858).

63. **Anisodes decretaria** Walk.

List. Lep. Ins. xxii. 650 (1861) (Sarawak).

Kabayau, near Kinabalu, 1 ♀.

The distribution of this obscure species cannot yet be given with any precision and even the determination may be open to challenge. Moore's *pallida* (1887), from Ceylon and India, seems synonymous, possibly also *javensis* (Warr., 1897), but all may possibly be forms of *obrinaria* Guen. (1858, Ceylon).

64. **Anisodes subrosea** (Warr.)

Perixera subrosea Warr., *Nov. Zool.* xiii. 61 (1906) (British New Guinea).

Marei Parei, 2 ♀♀; Lumu Lumu, 7 ♀♀; Kamborangah, 2 ♀♀.

It is unfortunate that as also of *flavissima*, the ♂ was not obtained, but the determination seems equally safe. New for Malaysia.

65. **Anisodes obliviaria** Walk.

List. Lep. Ins. xxii. 643 (1861) (Ceylon).

Kabayau, near Kinabalu, 1 ♀.

Distributed nearly throughout the Indo-Australian region; see Prout, *Ins. Samoa* iii (3) 127.

66. **Anisodes** sp.

Kamborangah 1 ♀.

Possibly a form of the little-known *roseofusa* (Warr., 1896, Mt. Mulu, N. Borneo, 1 ♂, 1 ♀), head, body and both surfaces of the wings much more deeply rosy, cell-spot of hindwing reduced to a dot.

67. **Anisodes dimerites** sp. n. (Pl. XI, fig. 10).

♂, 33 mm. Face dull brown. Palpus somewhat more reddish, 2nd joint with suberect scaling above, 3rd joint elongate. Thorax and abdomen concolorous with wings, the abdomen anteriorly with an ill-defined red-brown patch on side. Hindleg with a pencil from base of coxa, femur clothed with somewhat appressed light brown hair, tibia triangularly tufted, the hair proximally very long and red, regularly decreasing in length distally. Its end part light brown; terminal spurs only, the outer very short.

Forewing with areole well developed, SC^5 from its apex; pinkish buff, pretty evenly irrorated with black-grey; cell-mark ocellated, not very intense; markings nearly as in *denticulata* Hmpsn., antemedian less outbent in cell; vein-dots on the lines black. *Hindwing* similarly marked.

Underside somewhat paler, not irrorated, in places (at least of forewing) more suffused with pink; outlines of cell-marks, postmedian vein-dots and on forewing some indications of proximal subterminal shade pinkish grey; termen as above; fringe-dots minute.

Lumu Lumu, 5500 feet, 17 April, 1 ♂.

Distinguishable from *denticulata* by the ocellated cell-mark of the forewing, obsolescence of antemedian of hindwing, etc. also essentially different in the hindleg, which has the tibia and tarsus normally proportioned, the former clothed as in *subrosea* Warr., of which it can hardly be an extremely different colour-form. Two ♀♀ collected with it are probably conspecific, as is also a ♂ from Mt. Goliath (Central Dutch New Guinea) in coll. Tring Mus., though this latter probably represents a race, being rather smaller and paler, with the cell-rings rather larger, especially that of hindwing, which is clear white in its centre.

68. **Anisodes denticulata** Hmpsn.

Faun. Ind. Moths, iii. 447 (1895) (Naga Hills).

Marei Parei, 1 ♀; Lumu Lumu, 1 ♀.

Notwithstanding the absence of the ♂, there seems no ground for querying this determination. Although there are no previous records for Borneo, so far as I am aware, *glareosa* (Warr., 1907), from New Guinea, is evidently a race or almost a synonym of Hampson's species, pointing to a very wide range.

69. **Bytharia uniformis** Swinh.

Tr. Ent. Soc. Lond. p. 643 (1902) (Sumatra).

Lumu Lumu, 1 ♀.

Range: Java, Sumatra, Borneo, Celebes and Luzon, from the latter locality re-described as *Silvaspica baletensis* Schultze, gen. et sp. n., *Philipp. Journ. Sci.* xxviii. 572, t. 1, f. 1 (1915).

70. **Nobilia turbata** Walk.

List. Lep. Ins. xxiv. 1098 (1862) (Sarawak).

Kabayau, 2 ♂♂. Lumu Lumu, 1 ♂.

Distributed in the Malaysian subregion, with races or very closely related species in India, New Guinea and its islands and the Bismarck Archipelago.

71. **Antitrygodes divisaria** (Walk.)

Macaria divisaria Walk. xxiii. 927 (1861) (Canara).

Kabayau, near Kinabalu, 1 ♂.

Known from India, Malay Peninsula, Tonkin, Philippines, Burma and Java, with a named race from Formosa.

72. **Scopula rufistigma** (Warr.)

Craspedia rufistigma Warr., *Nov. Zool.* ii. 93 (1895) (Khasis).

Lumu Lumu, 1 ♂.

Only known to me from the Khasis, Tonkin, Perak and N. Borneo.

73. **Scopula vacuata** (Guen.)

Acidalia vacuata Guen., *Spec. Gén. Lep.* ix. 504 (1858) (Sarawak).

Kabayau, 5 ♂♂; Kiau, 1 ♂; Lumu Lumu, 1 ♂.

Apparently peculiar to Borneo.

74. **Scopula actuaria** (Walk.)

Acidalia actuaria Walk. xxii. 752 (1861) (Ceylon).

Kabayau, 1 ♂; ? Kiau, 1 ♀ (ab. ?—worn).

On the distribution, see *Nov. Zool.* xxxvii. 8.

75. **Sterrha actiosaria** (Walk.)

Acidalia actiosaria Walk. xxii. 750 (1861) (Ceylon).

Kiau, 1 ♂; Marei Parei, 2 ♂♂, 2 ♀♀; Lumu Lumu, 1 ♂.

76. **Sterrha themeropis** (West).

Eois themeropis West, *Nov. Zool.* xxxv. 257 (1930) (Luzon).

Lumu Lumu, 2 ♂♂, 2 ♀♀; Kamborangah, 6 ♂♂ 3 ♀♀.

No exact morphological investigation of this and the preceding have yet been undertaken and all determinations are provisional.

Subfam. LARENTIINAE.

77. **Acolutha pictaria subflava** subsp. n.

♂♀, 20–23 mm.

Forewing with the white parts somewhat narrower than in *A. p. pictaria* (Moore, 1888) the clayey brown markings less dark-mixed, the fine line close to termen weak. *Hindwing*, in contradistinction to that of *p. pictaria*, as strongly marked with yellow as the forewing, the white only remaining as narrow bordering to the brown markings. Marei Parei, 5,000 feet, 27 April—2 May, 2 ♂♂, 2 ♀♀.

78. **Eois mixosemia** Prout.

Sar. Mus. Journ. iii. 180, t. 7, f. 34 (1926) (Sarawak: Mt. Poi).

Marei Parei, 1 ♂; Lumu Lumu, 4 ♂♂.

79. **Eois plumbacea** Warr.

Pseudasthena plumbacea Warr., *Nov. Zool.* i. 396 (1894) ("New Guinea" [? Borneo]).

Marei Parei, 1 ♂, 1 ♀.

For a brief note on this species see *Nov. Zool.* xxxvii. 9.

80. **Poecilasthena nubivaga** sp. n. (Pl. X, fig. 19).

♂♀, 33–38 mm. Very near *thalassias* (Meyr., 1891) except in its far larger size. Palpus with the minute terminal joint more darkened. Antennal ciliation of ♂ ¼,

a little less minute than in *thalassias* (Meyrick says "¼" for *thalassias*, but I think it is in reality still less). Abdomen above more or less olive-mixed. *Forewing* a little broader, with termen not quite so oblique, cell on an average slightly less long, both areoles nearly always ample (in *thalassias* the proximal one very generally reduced); rather greyer green, with the white markings reduced or more greenish; cell-dot more conspicuous, blackish. *Hindwing* a little less bent at R^5; coloured as forewing. Underside less whitish than in *thalassias*, the forewing beneath in front of cell with some smoky suffusion proximally.
Pakka, 10,200 feet, 25 March, 3 ♂♂, 13 ♀♀.

81. **Poecilasthena character** sp. n. (Pl. X, fig. 20).

♂♀, 32–36 mm. Still closer to *thalassias* Meyr., pretty accurately agreeing in shape and structure, but almost equalling *nubivaga* in size. *Forewing* with cell in ♂ not or scarcely over 1½ (in *thalassias* ♂ often more definitely over); proximal areole generally ample, never greatly reduced.

Decidedly different in respect from *nubivaga* when series of the two are placed side by side, though the differences are not all easy to bring out in words. Distal and especially costal margin of forewing somewhat less curved; the green colour, in addition to (or perhaps chiefly because of) its admixture of white, presents a very manifest difference in tone or hue—when viewed from a distance *nubivaga* giving an impression of gnaphalium-green (or, if at all influenced by moisture, of tea-green), *character* of court-grey—cell-dot of the forewing generally reduced, on an average slightly more distally placed; costal edge more deeply coloured; the three postmedian lines generally differentiable (in *nubivaga* more suffused); cell-dot of hindwing rarely visible.

Kamborangah, 7,200 feet, 26 March—1 April, 7 ♂♂, 1 ♀, including the type ♂; Marei Parei, 5,000 feet, 29—30 April, 3 ♂♂, 1 ♀.

Here will probably belong—though perhaps as a separable race—an almost equally large *Poecilasthena* from Pahang (Gunong Tahan, 5,500 feet) which I have previously determined as a giant form of *thalassias*. In both *character* and *nubivaga* the postmedian group of lines on the hindwing (with the whitish line beyond it) forms an almost direct continuation of that of forewing; in *prouti* West (1929)—which, moreover, has the forewing appreciably more bent in the middle—it arises more proximally and runs straighter (and more obliquely) to abdominal margin, especially in the ♂, and there is *no trace of cell-dot* on hindwing. *P. prouti* has the costa of the forewing rounded almost as in *nubivaga* but is narrower-winged, the tornus of that wing weakened.

82. **Gonanticlea occlusata laetifica** Prout.

Nov. Zool. xxxvii. 23 (1931) (N. India).

Lumu Lumu, 4 ♂♂.

The forms of this species from Tonkin, the Malay Peninsula and Borneo are certainly nearer to the North Indian than to the name-typical *occlusata* (Feld., 1875) of Ceylon, although further subdivisions may ultimately be found possible.

83. **Gonanticlea amplior** Th.—Mieg.

Gonanticlea occlusata var. *amplior* Th.—Mieg, *Le Nat.* xxxii. 43 (1910) (Kinabalu).

Lumu Lumu, 1 ♀.

I have this species recorded also from the Malay Peninsula, Sumatra and Java. The ♂♂ are easily distinguishable from those of the preceding by their shape, strongly developed pencils on the last sternites, etc.; but the capture of this ♀ together with *occlusata* ♂♂ suggests the possibility that I may have misjudged the specimen, which I cannot now compare.

84. **Gonanticlea aversa** Swinh.

Tr. Ent. Soc. Lond. 1892, p. 4 (Khasia Hills).

Marei Parei, 1 ♀.

Hitherto only known from N. India, Burma and the Malay Peninsula.

85. **Paracomucha moroëssa** sp. n. (Pl. X, fig. 3).

♂, 35–36 mm. Clearly representative of *chalybearia* (Moore, 1867), of which, however, it is scarcely possible to regard it as a race, since the differences are structural. Abdomen with the pencils much less highly developed. Smaller; the forewing otherwise almost exactly like the most strongly blue-white-spotted forms of *chalybearia;* hindwing with termen more rounded, scarcely folded posteriorly, submedian fold and distal part of abdominal margin without the coarse hair-clothing of *chalybearia.*

Lumu Lumu, 5,500 feet, 8 and 14 April, 2 ♂♂.

86. **Ecliptopera zaës** sp. n. (Pl. IX, fig. 11).

♂, 51 mm. Head and body light brownish, inclining to cream-buff, in places (especially dorsally on thorax and part of abdomen) with dark suffusions. Palpus longish-moderate, with 3rd joint relatively elongate. Antenna with the joints slightly projecting (somewhat triangularly), very shortly ciliated.

Forewing with termen very slightly more sinuous than in *obscurata* (Moore, 1888); coloration similar, but with sharper contrasts the black admixture in the dark parts rather stronger; pale lines rather broad; two subterminal ones, much thicker than in *rectilinea* Warr. (1894) and divaricating less strongly, the proximal of them indistinct;

edge of basal patch relatively straight; median band broad, but cut by a pale line in front of fold, the angulation of the antemedian the longer and more acute; anterior terminal patch rather narrow. *Hindwing* with termen rounded; whitish buff, with avellaneous suffusion in abdominal region proximally and about termen very narrowly.

Underside paler than in *obscurata* and *zophera* Prout (1931), with similar markings, especially to those of the latter but without special suffusion about median and its branches on forewing; hindwing with cell-spot and both the outer lines distinct and a browner terminal spot, quite as in many *Lygris prunata* (Linn.).

Kamborangah, 7,200 feet, 4 April, 1 ♂.

87. **Ecliptopera furvoides** (Th.—Mieg).

Cidaria furvoides Th.—Mieg, *Misc. Ent.* xxii. 37 (1915) (Kinabalu).

Kiau, 1 ♀; Marei Parei, 2 ♂♂, 1 ♀; Lumu Lumu, 2 ♂♂, 1 ♀.

So far as is yet known, this species is confined to Kinabalu.

88. **Dysstroma pendleburyi** sp. n. (Pl. X, fig. 9).

♂♀, 35–38 mm. Very similar to *heydemanni* Prout (*Nov. Zool.* xxxvi. 162, Luzon). Posterior thoracic whitish spot fairly well developed, but not, in either of the known examples, confluent with any similar maculation of the abdomen. *Forewing* with median area scarcely so broad, in the ♂♂ much less than half as broad on hindmargin than on costa, in all the examples with the outer lobe fairly strong, the postmedian line very slightly oblique inward from costa, changing its direction rather sharply at R^1; cell-mark more or less elongate, generally longer than in *heydemanni*.

Underside more sharply marked than in *heydemanni*.

Kamborangah, 7,200 feet, 2 ♂♂, 1 ♀.

Dr. Heydemann, of Kiel, has kindly examined the genitalia and pronounces this a good species, not—as I had been inclined to suspect—a race of *heydemanni*: "Must be placed between *rufibrunnea* (Warr.) and *heydemanni*. It has a large but slender aedoeagus with short, rather thick (at the base in particular strikingly bladdery-looking) thorns on the vesica." (Heydemann in litt., 10 June 1931).

89. **Propithex glaucisparsa** sp. n. (Pl. XI, fig. 27).

♂♀, 21–25 mm. Head and palpus fuscous, with scattered pale blue scales; vertex browner; palpus about 2½, proximally cinnamon beneath. Thorax and abdomen above mixed with brighter browns than beneath and—as also the legs—with some scattered pale blue scales; abdominal tergites with some pale scaling behind.

Forewing with DC gently and regularly curved, R^2 central; glossy, varied brown, inclining to warm sepia, between ante- and postmedian bands and in distal area paler, almost throughout—but especially in the paler parts and in places on the veins—sprinkled with pale grey-blue scales; an ill-defined costal patch near base more reddish; basal patch scarcely differentiated; antemedian band tapering posteriorly, its pale proximal scaling angled close to costa; postmedian band rather solid to R^1, thence chiefly expressed by its boundary-lines; ill-defined dark distal shading about the radials; terminal line marked with pale blue dots at the vein-ends; fringe feebly dark-clouded. *Hindwing* with DC weakly biangulate; almost unicolorous, dusky drab.

Underside rather less strongly glossy, coloured nearly as hindwing above, but not quite so uniform, the hindwing showing traces of a curved postmedian.

Kamborangah, 7,200 feet, 27 March, type ♂; Lumu Lumu, 5,500 feet, 11 April, 1 ♂, 12 April, 1 ♀.

Not very close to any known species, but fits well into *Propithex* Warr. (1899); in the type specimen of *P. alternata* Warr., DC of the hindwing is hardly angulated, though the position of R^2 in relation to the cell-fold shows the same essential structure, and this interpretation is confirmed by other examples.

90. **Carbia calescens** Walk.

List Lep. Ins. xxxv. 1695 (1866) (Borneo)

Marei Parei, 2 ♀♀; Lumu Lumu, 1 ♀

Only known from Borneo, with Pulo Laut. The *calescens* ♂ of Meyrick (*Tr. Ent. Soc. Lond.* 1897, p. 69) from S. E. Borneo is correctly determined, the ♀ belongs to *C. moderata* (Walk., 1866, as *Eupithecia*).

91. **Pomasia vernacularia** Guen.

Spec. Gén. Lép. ix. 437 (1858) (Sarawak)

Marei Parei, 25; Lumu Lumu, 8.

All the examples belong more or less definitely to the form *salutaris* Prout (1929) which I have suggested is probably a mountain form rather than a strictly geographical one. It was described from the Barisan Range, S. W. Sumatra (2.500 feet) and the similarity of the Mt. Murud from (Sarawak, 1.500 feet) noticed. More typical *vernacularia* occurs in the Malay Peninsula and on Sipora Island; Guenée's two ♀♀ were probably from no great altitude.

92. **Collix blosyra** Prout.

Sar. Mus. Journ. iii. 181, t. 7, f. 41 (1926) (Sarawak: Mt. Murud).

Kamborangah, 2 ♀♀.

93. **Collix mesopora** sp. n. (Pl. X, fig. 7).

"*Collix exemplata* Warr." Prout, *Sar. Mus. Journ.* iii. 180 (1926) (err. det.) (Sarawak).

♂ ♀, 37–39 mm. Closely similar to *praetenta* Prout (1929), of which it may possibly prove a subspecies, although the build appears a trifle more robust and the antenna of the ♂ more compressed laterally. *Forewing* rather broader, with cell-spot larger; in coloration more mottled, more inclining to brown, the band formed by group of postmedian lines rather broad. *Hindwing* with similar colour distinctions; cell-dot generally very minute. Both wings beneath, in addition to the markings of *praetenta*, with a slender median line present, just outside the cell-spot, occasionally even crossing it.

Lumu Lumu, 5,500 feet, 6–12 April, 3 ♂ ♂, 2 ♀ ♀; the type ♂ dated 8 April; Marei Parei, 5,000 feet, 3 ♀ ♀.

Further ♀ ♀, from Mt. Poi and Mt. Penrissen (Sarawak) were provisionally determined as *praetenta* Prout, as was also a Lumu Lumu ♀ which was returned to the F.M.S. Museums before I had discovered the differences but which will certainly prove to belong here; Mr. A. E. Wileman obtained a closely similar or almost identical race in Benguet, Luzon (5,000–7,000 feet)—only a few examples in indifferent condition.

Three doubtful specimens (1 ♂, 2 ♀ ♀) collected at Lumu Lumu may also be mentioned here, but can hardly be conspecific with *mesopora*; the ♂ and 1 ♀ have lost their palpi, but in the other ♀ they seem decidedly shorter than in the present species: too worn to be dealt with definitely.

94. **Horisme intrepida** sp. n. (Pl. X, fig. 1).

♂ ♀, 40–42 mm. Larger than *hirtivena* (Warr., *Nov. Zool.* xiii. 97), which it apparently represents in Borneo. Raised tufts of black scales on M of forewing rather less developed. Colouring, at least in the ♂, more reddish. Forewing beneath with *three* equally developed postmedian lines; hindwing beneath less sharply marked than in *hirtivena* and with a longitudinal whitish streak behind R distally, interrupting the subterminal.

Kamborangah, 7,200 feet, 26 March—4 April, 4 ♂ ♂, 1 ♀.

This species and *hirtivena* are not quite typical *Horisme* ("*Cocnocalpe*" in sens. Warr.), though Warren does not notice some of the structural characteristics; palpus longer. than 2nd joint with long-projecting hair-scales above and beneath, the 3rd. joint rather long and exposed; a strong pale anal tuft in ♂; hindwing with termen rather deeply dentate, cell-fold very forward, R^2 consequently arising well behind it, though still somewhat before middle of DC, DC^2 slightly angled inward at cell-fold, occasionally with a slight angle outward at origin of R^2. To some extent connected with the more typical group through *H. flavofasciata* (Moore, 1888).

95. **Horisme hyperythra** (Hmpsn.)

Philalapteryx hyperythra Hmpsn., *Faun. Ind. Moths*, iii. 347 (1895) (Nilgiris, etc.).

Lumu Lumu, 1 ♀.

Known from Ceylon, India, Riu-Kiu Islands, Formosa, Luzon, Borneo, Java and (?) Sumatra.

96. **Horisme labeculata** sp. n. (Pl. X, fig. 10 ♀).

♂, 25 mm.; ♀, 30–31 mm. Near *rufilunata* (Warr., *Nov. Zool.* xiii. 121, as *Eucymatoge*), the ♀♀ larger. *Forewing* slightly less clear white; subbasal band less heavy, less broadened, more oblique inward posteriorly; antemedian much less irregular; pale subterminal rather better defined, in anterior half scarcely denticulated. *Hindwing* rather more greyish, dentate subterminal indicated (whiter), bounded proximally by a faintly darkened shade; bisected whitish band between this and the postmedian also indicated posteriorly. Underside much more darkly suffused.

Marei Parei, 5,500 feet, 29 April (♂ type and a ♀) and 1 May (♀ allotype). Also a worn and torn ♂ from Lumu Lumu, 5,500 feet.

Only the second known member of its group from the Malayan subregion, the first being *H. murudensis* Prout, *Sar. Mus. Journ.* iii. 181 (1926).

An apparently near relative of *labeculata*, with more angled markings, is represented by a single ♀ from Marei Parei, too poor to describe.

97. **Eupithecia albifurva** Hmpsn.

Journ. Bomb. Nat. Hist. Soc. xviii. 49, t. E, f. 8 (1907) (Ceylon).

Lumu Lumu, 2 ♀♀; Kamborangah, 1 ♀.

Variable. The identity of this (which seems also to occur on Luzon) with Hampson's species is by no means certain. In fact the whole group (that of *ustata* Moore, 1888) is in confusion, few specimens being yet known and hardly two quite alike.

98. **Eupithecia melanolopha** Swinh.

Ann. Mag. Nat. Hist. (6) xvi. 296 (1895) (Khasis).

Lumu Lumu, 2 ♂♂, 1 ♀; Kamborangah, 1 ♀.

Known from Assam, Tonkin and Ceylon (? race). I suspect, however, it will sink to *compsodes* Meyr. (1891, New South Wales), in which case it will be one of the very wide-ranging *Eupithecia*.

99. **Eupithecia costalis** (Walk.)

Pena costalis Walk. xxvii. 130 (1863) (Sarawak).

Lumu Lumu, 1 ♀.

Known also from India.

100. **Eupithecia (Mnesiloba) eupitheciata** (Walk.)

Philalapteryx eupitheciata Walk. xxvi. 1720 (Australia).

Marei Parei, 1 ♂, 4 ♀♀; Lumu Lumu, 1 ♂.

Distributed in the greater part of the Indo-Australian region; see list of known localities in *Ins. Samoa* iii. 134, to which I add Luzon (abundant).

101. **Eupithecia** sp.

Kamborangah, 1 ♂.

Worn and still further precluded from description by the loss of palpi and legs. I have not been able to match it.

102. **Micromia (Prosthetopteryx) chlaenistes** sp. n. (Pl. X, fig. 25).

♂, 22–24 mm. Larger and duller than *scotochlaena* Prout (*Nov. Zool.* xxxvii 26, Central Dutch New Guinea). Antennal ciliation minute. *Forewing* with the costal margin slightly more arched; basal patch hay's brown rather than blackish (with the lines brown, finely irrorated with blackish), almost reaching the small concise cell-dot; costal spots less pronounced; median area buff-tinged, not testaceous; beginning of postmedian line oblique outward to R^2, with an indentation in front of R^1; subterminal line almost obsolete in middle, where the distal area is more cloudy. *Hindwing* with border rather darker than in *scotochlaena*.

Kamborangah, 7,200 feet, 1 and 4 April, 4 ♂♂.

Since this description was drawn up, it has occurred to me that ["*Eupithecia*"] *Micromia dinosia* (Prout, *Sar. Mus. Journ.* iii. 183, t. 7, f. 30) may be the ♀ of this species, larger and considerably darker (notably on the hindwing), but otherwise very similar, especially in the maculation, as well as the venation, of the forewing; but as its palpus is considerably longer and its postmedian anteriorly rather less oblique, it is necessary to wait at least for the occurrence of the two together before suppressing *chlaenistes*.

103. **Micromia (Prosthetopteryx) lastistriga cophogona** subsp. n. (Pl. XI, fig. 20).

♂ Differs from *M. l. latistriga* (Warr. *Nov. Zool.* xiii. 125, British New Guinea) in having the angle of the distal edge of the median area more obtuse, the anal tuft less white, the specialized dark-grey scaling of the upperside of the hindwing more bluish, apical dash of forewing on an average less broad. Lumu Lumu, 5,500 feet, 8–12 April, 6 ♂♂.

104. **Micromia (Tripteridia) subcomosa animata** subsp. n. (Pl. XI, fig. 6).

♂, 22 mm. Rather larger than *M. s. subcomosa* (Warr., *Nov. Zool.* xiv. 161, British New Guinea), forewing with the oblique pale apical streak broader, hindwing with the interior scaling of the hindmarginal pocket less black.

♀ similar, excepting the sexual modifications of the tornal region of the ♂, the hindwing smooth-margined, greyish, with indistinct darker lines, forming in proximal part a slight shading which is bounded distally (outside the postmedian) by a double pale line.

Lumu Lumu, 5,500 feet, 6–11 April, 1 ♂ (type), 2 ♀♀; Marei Parei, 5,000 feet, 28–30 April, 1 ♂, 3 ♀♀. I have also recorded, without naming, a ♂ from Mt. Poi (*Sar. Mus. Journ.* iii. 188).

Of *s. subcomosa* I know only the 3 original ♂♂.

105. **Chloroclystis celaenacris** sp. n. (Pl. XI, fig. 5).

♂♀, 22 mm. Head cartridge-buff, mixed with brown; palpus not quite 2, dark fuscous, with pale tip. Antennal ciliation minute. Body cartridge-buff, heavily dark-mixed. Legs largely infuscated, the tibiae and tarsi pale at extremities of joints.

Forewing with SC^1 running into C; from base to postmedian indefinite brownish, the colour produced by bone-brown or fuscous irroration on a pale ground, the basal part more mixed with olive-buff, apparently with a deep olive-buff band bounding the antemedian (in both examples here somewhat rubbed); costal edge more reddish; median area with slender and ill-defined lines, two stronger fuscous lines representing the antemedian, one thick one the postmedian; a deep olive-buff, faintly bisected band outside the postmedian; terminal area mostly very dark slate, relieved by some pale irroration, the apical part darkest, a pale spot between R^2 and M ; terminal line interrupted by small dots on the veins; fringe with pale proximal spots or dots at the vein-ends. *Hindwing* with SC^2 just separate, DC^3 oblique inward as compared with DC^2 (nearly at a right angle with abdominal margin, R^2 slightly behind middle, M^1 about connate (♂) or stalked (♀); glossy mouse-grey, becoming broadly paler distally; no definite markings.

Forewing beneath glossy grey, the costal edge in the median area pale in the ♂, the chief markings of the upperside weakly indicated. Hindwing beneath darkened except towards base; distal half in ♂, between M^1 and costa, clothed with some long hair-like scaling; a thick, but not very sharply defined, somewhat sinuous dark line (very narrow band) from midcosta to about ½ abdominal margin, edged distally by an ill-defined pale line. Lumu Lumu, 5,500 feet, 18 April, type ♂; Marei Parei, 5,000 feet, 29 April. a ♀, unfortunately with hindwing badly torn.

Possibly more related to *subusta* (Warr., 1898, "*Dasimatia*") than to anything else yet known to me.

106. **Chloroclystis plicata** Hmpsn.

Journ. Bomb. Nat.Hist. Soc. xviii. 1248, t. G, f. 27 (1912) (Ceylon).

Kamborangah, 1 ♀.

Probably a race, slightly greenish, the hindwing with the sinuosities of the postmedian somewhat strengthened, etc.

107. **Chloroclystis modesta** (Warr.) (?)

Calluga modesta Warr., *Proc. Zool. Soc. Lond.* p. 383 (1893) (Darjiling).

Lumu Lumu, 2 ♀♀; Kamborangah, 1 ♀.

Seem identical with the ♀♀ from Mt. Murud doubtfully referred here in *Sar. Mus. Journ.* iii. 186. The true *modesta* pretty certainly reaches Ceylon and Assam and I have other doubtful records for Selangor and Borneo.

108. **Chloroclystis turgidata** (Walk.)

Bosara turgidata Walk. xxxv. 1693 (1866) Borneo [Sarawak]).

Marei Parei, 1 ♀; Lumu Lumu, 3 ♀♀.

Only known from Borneo.

109. **Chloroclystis (Gymnopera) rubroviridis nubifera** subsp. n. (Pl. XI, fig. 8).

♂♀, 19–21 mm. Generally smaller than r. *rubroviridis* Warr. (1896); ♂ with the rough specialized scaling on the proximal half of the hindwing above much darker grey, tinged with warm sepia, the corresponding area of the forewing beneath (from M hindward) also much more differentiated than in the name-type, buffy brown.

Marei Parei, 5,000 feet, 28 April—2 May, 6 ♂♂, 8 ♀♀, including the type; Lumu Lumu, 5,500 feet, 7–13 April, 4 ♀♀;

Here will belong also the ♀ from Mt. Murud, Sarawak, recorded in *Sar. Mus. Journ.* iii. 187.

110. **Chloroclystis (Gymnopera) obturgescens** Prout.

Sar. Mus. Journ. iii. 187 (1926) (Sarawak: Mt. Murud).

Marei Parei, 1 ♂, 3 ♀♀; Lumu Lumu, 1 ♀; Kamborangah, 3 ♂♂, 1 ♀.

No further localities are yet known.

111. **Chloroclystis (Syncosmia) xanthocomes** (Prout).

Rhinoprora xanthocomes Prout, *Journ. Bomb. Nat. Hist. Soc.* xxx. 320, t. 1, f. 26 (1926) (Upper Burma).

Lumu Lumu, 1 ♀ ab.

The specimen has the proximal part of the median band narrowly blackened (less narrowly posteriorly than anteriorly).

Range: N. India, Burma, Borneo, I think also Negros (1 ♀) and perhaps Java.

112. **Chloroclystis telygeta** sp. n. (Pl. XI, fig. 2).

♀, 20 mm. Head pale green. Face-cone developed. Palpus somewhat over 2, pale at base, then strongly mixed with dark fuscous; terminal joint moderate. Body concolorous with wings.

Forewing ecru-olive, with median area except at costa (about to SC) white; minute and sparse dark irroration, antemedian band-like, though not perfectly solid, slightly constricted in the middle, its proximal edge being somewhat concave; postmedian rather heavy, also faintly band-like (though rather weak proximal shading, which only becomes more conspicuous at and behind M^2), leaving a clear whitish spot between radial fold and M^1; fringe dark-mottled. *Hindwing* with SC^2 very shortly stalked; light drab, faintly tinged with olive, abdominal margin distally a little paler; lines not intense, the postmedian strongest, bluntly angled at R^3, the antemedian double

Both wings beneath as hindwing above or slightly darker; somewhat band-like ante- and postmedian lines indicated, but quite weak.

Marei Parei, 5,000 feet, 28 April, 1 ♀.

The Tring Museum has a slightly smaller, but otherwise identical, ♀ from the Poeh Mountains.

113. **Chloroclystis (Rhinoprora) eurymesa** Prout.

Sar. Mus. Journ. iii. 184, t. 7, f. 40 (1926) (Sarawak).

Marei Parei, 1 ♂, 5 ♀ ♀; Lumu Lumu, 2 ♂ ♂, 3 ♀ ♀, besides one rather doubtful ♀ (small and worn); Kamborangah, 36 ♂ ♂, 1 ♀.

The original records, including one from Pahang, gave the altitudes as ranging from 4,800 feet to above 6,000. The splendid series taken at Kamborangah (7,200 feet) and its absence from the lower stations on Kinabalu suggest that this is exclusively a mountain species.

114. **Chloroclystis (Rhinoprora) palpata** (Walk.)

Cidaria palpata Walk. xxv. 1404 (1862) (S. India).

Marei Parei, 1 ♂, 2 ♀ ♀; Lumu Lumu, 1 ♂, 1 ♀; Kamborangah, 2 ♂ ♂, 3 ♀ ♀.

The most widely distributed of the subgenus—Ceylon, India, W. and S. China the Philippines (?), Borneo and Java. I believe there will prove to be racial, as well as considerable individual variation, but I have not yet been able to work out any satisfactory arrangement. A ♂ from Kabayau, near Kinabalu, 14 March, appears to have the terminal segments of the abdomen and their tufts more highly developed, but until an opportunity is found for an investigation of the genitalia of the group I hesitate to pronounce upon its status.

115. **Chloroclystis (Rhinoprora) coelica** sp. n. (Pl. XI, fig. 1).

♂, 22 mm. Face whitish, the upper part clouded with dark olive-grey. Palpus well over 3, 2nd joint extremely long, dark-sprinkled and clouded. Thorax above mottled, rather dark; abdomen with a tawny belt at base, then variegated, largely dark olive-grey or iron-grey (especially at ends of segments), but relieved with some whitish and (especially in middle of segment) some tawny admixture.

Forewing variegated, chiefly white and light yellowish olive; markings fuscous, slightly mixed with red; basal patch ill-defined, with curved edge; an ill-defined band (nearly 1 mm. wide) on the succeeding olive area; ante- and postmedian lines weak and slender, bounding a moderately broad median area, which is white in centre, with a moderately large cell-dot, olive before and behind, with some dark maculation; the weakly divided band outside the postmedian coloured like median area; distal area irregularly clouded, showing a very fine, partly interrupted subterminal line; fringe with rather strong dark spots opposite the veins. *Hindwing* glossy, pale neutral grey to whitish according to the incidence of the light; fringe dark-spotted.

Underside dirty whitish grey, more suffused with light drab on forewing (except posteriorly), both wings with cell-dot and rather weak postmedian line, that of the hindwing bent at R , best developed on the veins; traces—especially on the forewing—of a faint presubterminal band; fringes faintly spotted.

Pakka 10,200 feet, 23 March, 1 ♂.

In some respects—abdominal maculation (not mentioned in original description), unmarked hindwing, etc.—somewhat analogous to the *Rhinoprora* of the highest part of Mt Gede (*oribates* Prout, 1925).

116. **Chloroclystis (Rhinoprora) eurystalides** sp. n. (Pl. XI, fig. 4).

♂, 20 mm. Head whitish, tinged with green, gena and palpus more strongly greenish; palpus over 2, but scarcely extreme enough for a *Rhinoprora.* Thorax above greenish: abdomen above with segments 2–8 suffused with hazel, the small crests almost black, set in whitish.

Forewing white, suffused (especially anteriorly, terminally and about the edges of the dark markings) with pale green; subbasal line slight: a fuscous bar (anteriorly mixed with red) between this and central fascia: the latter darkened by a mixture of reddish and greenish scaling and especially by four more fuscous lines, the two postmedian inclined to coalesce posteriorly; postmedian bluntly angled behind SC^5, then straight; cell-mark indistinct, on the 2nd line; white band outside the postmedian rather broad, at R^1 bifurcating; subterminal band within the fork and again from R^1 hindward fuscous mixed with red, sending out a branch to termen between the radials, behind which is a white patch in cellule 3; terminal line interrupted; fringe spotted. *Hindwing* white; a not very sharply defined, dusky subterminal band, in places vaguely connected with termen.

Underside more blurred, the principal markings of the upper reproduced; cell-dots fairly distinct, on hindwing small.

Kamborangah, 7,200 feet, 1 April, 1 ♂.

A rather glossy, sharply-marked little species, with some superficial suggestion of a *Psaliodes*.

117. **Chloroclystis (Gymnodisca) viridata** (Warr.)

Rhinoprora viridata Warr., *Nov. Zool.* ii. 111 (1895) (Perak).

Kamborangah, 2 ♂♂.

Hitherto only known from the Malay Peninsula, except that I have described a race of it from Ceram—*solidifascia* (Prout, 1929).

118. **Chloroclystis (Gymnodisca) rubrifusa** (Warr.)

Nov. Zool. ii. 109 (1895) (Perak).

Marei Parei, 2 ♀♀.

Occurs also on Sumatra. Possibly the present examples represent a subspecies, as the postmedian line looks a little more sinuous than is normal.

119. **Chloroclystis (Gymnodisca) viridescens** (Warr.)

Nov. Zool. ii. 110 (1895) (Perak).

Marei Parei, 2 ♂♂.

Range closely as in the preceding, though I have not been able to separate the Moluccan form (Buru and Ceram) even racially. The ♂ venational peculiarities on which Warren founded his genus *Gymnodisca*, are considerably more highly developed here than in *viridata*, which may be regarded as a link with the preceding group.

120. **Chloroclystis (Gymnodisca) chlorocampsis** (Prout).

Rhinoprora chlorocampsis Prout, *Sar. Mus. Journ.* iii. 185 (1926) (Sarawak: Mt. Murud).

Kamborangah, 4 ♂♂, 4 ♀♀.

Described from a single ♀. The ♂ proves to be, according to my forecast, a member of the *Gymnodisca* group, but it would be at least premature to sink it to *regularis* Warr. (1895).

121. **Calluga costalis** Moore.

Lep. Ceyl. iii. 480, t. 206, f. 1 (1887) (Ceylon).

Marei Parei, 1 ♂.

Evidently widely distributed. I have records from Ceylon, India, Burma, Tonkin, W. China, ? Formosa, ? Philippines, Borneo and Celebes; in addition, a race (?) from Queensland has been named *cissocosma* (Turn., 1904) and—so far as I can make out—renamed *albiviridis* (Warr, 1907) from New Guinea, while another apparent representative of this eastern assemblage has been taken on Buru, in a single ♀ (see *Treubia* vii. 439).

122. Gymnoscelis polyclealis (Walk.)

Botys polyclealis Walk. xix. 998 (1859) (Ceylon).

Lumu Lumu, 1 ♂.

I had already seen this species from Borneo and also from Luzon, British New Guinea and Rossel Island. It must be extraordinarily overlooked.

123. **Gymnoscelis merochyta** sp. n. (Pl. XI, fig. 3).

♂, 24 mm. Head pale, the face and palpus mixed with reddish, the occiput with grey; face-cone fairly strong, palpus about 1½, the 2nd. joint dark-spotted proximally and with small dark-mixed tufts at end, the lower less strong than the upper. Antenna scarcely ciliated, dark-dotted above. Body pale; abdomen very slender, elongate; crests well developed, not darkened.

Forewing elongate SC^1 anastomosing rather shortly with C; ground-colour white, with wavy submacular lines of a rather dark olive-buff (probably greener when bred); a large part of the wing nearly olive-brown ($16'''$ k of Ridgway "Color-standards," pl. XL) in varying intensity, chiefly concentrated in median area and apically; denticulate postmedian and subterminal lines anteriorly, the former very fine; terminal line extremely fine, scarcely interrupted; fringe dark-spotted opposite the veins. *Hindwing* elongate, termen scarcely waved except from M^1 to tornus; SC^2 short-stalked; white with fine, wavy buff lines, only the last two broad and band-like; cell-dot small, grey; terminal line and fringe-dots slight.

Underside whitish, with the markings faintly indicated.

Lumu Lumu, 5,500 feet, 9 April, 1 ♂.

Larger than the variable and difficult ♂ ♂ of the *imparatilis* (Walk., 1865) group, the wings not quite so extremely narrow, the hindwing quite differently marked.

124. **Gymnoscelis** sp.

Kamborangah, 7,200 feet, 31 March, 1 ♂.

Of about the size and general structure of the preceding, but still more extreme in shape, about as in *tristrigosa* (Butl., 1880), the hindwing with the characteristic markings of that group; will probably be recognizable by the extreme outward run of the postmedian of the forewing from SC^4 to R^2, as well as the costal spots from which the postmedian and the subterminal arise, but is unfortunately too wasted to admit of an adequate description.

125. Gymnoscelis fasciata Hmpsn.

Ill. Het. viii, 118, t. 152, f. 22 (1891) (Nilgiris).

Chloroclystis exangulata Warr., *Nov. Zool.* xiv, 153 (1907) (British New Guinea).

Marei Parei, 6 ♂ ♂, 1 ♀.

The known distribution is curiously similar to that of *polyclealis*, though I have no record for Ceylon, while it is fairly common in the Malay Peninsula. I believe it even reaches Fiji, but in any case the form from Alu, Solomons (see *Faun. Ind. Moths* iii. 389) is quite typical.

126. Gymnoscelis tibialis (Moore).

Iramba tibialis Moore, *Lep. Ceyl.* iii. 481, t. 206, f. 2 (1887) (Ceylon).

Kiau, 1 ♀.

Here again we find a great gap is in the geographical distribution, so far as it is at present known. Name-typical *tibialis* is exclusively Indo-Malayan, while the only other known representative of the structure-group (*lophopus* Turn., 1904), so close to it that it might almost prove a synonym, at most a race, inhabits Queensland and New South Wales.

127. Hybridoneura cristata (Warr.)

Gymnoscelis cristata Warr., *Nov. Zool.* iv. 229 (1897) (Khasis)

Lumu Lumu, 1 ♀.

Extremely widely distributed from Ceylon to Bougainville, if not to Fiji, yet so rare that I have scarcely over a dozen stations recorded for it; see *Ins. Samoa* iii. 145. where also the synonymy is discussed.

128. Brabira emerita Prout.

Sar. Mus. Journ. iii. 189, t. 16, f. 1 (1926) (Sarawak).

Lumu Lumu, 4 ♂♂, 1 ♀: Kamborangah. 1 ♂, 2 ♀♀.

129. Goniopteroloba solivaga sp. n. (Pl. XI, fig. 19).

♀, 29 mm. Head and thorax concolorous with wings. (Abdomen wanting). Palpus over 2, at base paler, on outerside rather warmer (more yellowish) than ground-colour. Pectinations long for a ♀.

Forewing broad, angle at R^3 slightly blunter than in the genotype (*zalska* Swinh., 1894) posterior part much less oblique SC^1 stalked to considerably beyond SC^2; pinkish buff, with a few scattered dark-grey scales; lines orange-cinnamon; antemedian obsolescent anteriorly; postmedian faintly edged with brownish proximally, inbent near costa; some indistinct brownish shading just outside the postmedian; a large dark subterminal dot between R^1 and R^2. *Hindwing* considerably broader than in *zalska*, the angle at R^3 much weaker; SC^2 about connate, R^2 from rather before middle of DC; concolorous with forewing, the grey sprinkling stronger; cell-dot indicated; postmedian developed posteriorly.

Underside slightly paler; forewing in part with heavy dark irroration, and with traces of the maculation of distal area; both wings with large cell-dot and thick dark-grey postmedian line.

Kamborangah, 7,200 feet, 25 March, 1 ♀. A ♂ from Lumu Lumu which I passed over as "too worn to describe" may have belonged here; merely noted as being "scarcely a subspecies of *sinuosa* Warr., of which the unique type ♀ (Perak) is very much paler, and it is unlikely that the ♂ would have so strong a tooth at R^3 of forewing.

Not particularly near any known species; might be placed between *sinuosa* Warr. (1895) and *fuscata* Warr. (1897), with which latter it may have some affinity. A curious venational point—probably only an individual freak but possibly of phylogenetic significance—is the strong forking of C in both hindwings, shortly after the arrival of the connective bar from SC; if this bar be really the generally lost vein SC^1 (as is assumed when—in some *Oenochrominae*—it is found near the base) and not a "compensation" for the reduction of the hind-marginal area (as has been assumed for the *Lobophora* group, Meyrick, *Tr. Ent. Soc. Soc. Lond.* 1892, pp. 57–58), we should here say "SC^1 anastomosing with, instead of running into C."

130. **Goniopteroloba biconjuncta** Prout.

Sar. Mus. Journ. iii. 188, t. 7, f. 33 (1926) (Sarawak: Mt. Murud).

Lumu Lumu, 4 ♂♂, 2 ♀♀; Kamborangah, 3 ♂♂, 1 ♀.

Variable, but apparently all one species; lines either slender or thicker in most specimens (but not in all) inclined to thicken at costa, in the three most heavily marked ones also at fold; none have the second "conjunction" of the lines on which I named the type, but the antennal pectinations, the shape of the hindwing, and the presence on it of a cell-dot and a posterior dark bar between the postmedian and subterminal, in addition to the geographical probabilities, refer them to *biconjuncta* rather than to *conjuncta* Warr. (1897, Mindoro). Yet it must be admitted that the relation of the two is extremely close and a slight irregularity in the number of the pectinate joints of the antenna further complicates the question, suggesting another (though rather remote) possibility, that we may have on Kinabalu both *biconjuncta* and a race of *conjuncta* existing side by side. A ♂ in the Hamburg Museum, labelled "Bukit Raja (Borneo) above 2200 m." clearly belongs with the Kinabalu series.

131. **Phthonoloba leptomita** Prout.

Sar. Mus. Journ. iii. 190, t. 16, f. 2 (1926) (Sarawak: Mt. Murud).

Lumu Lumu, 1 ♀; Kamborangah, 1 ♀.

The only previously known example was also a ♀, the holotype, from the summit of Mt. Murud, 7,200 feet.

132. **Phthonoloba titanis** Prout.

Pakka 10,200 feet, 3 ♂♂, 2 ♀♀.

This fine species likewise was described from a single ♀, without given altitude, and its rediscovery is very interesting. The following form requires a separate name and diagnosis and is possibly a distinct species, though it clearly represents *titanis* at a lower altitude; one heavily marked ♂ is so extremely like *t. titanis* in markings (only with the subterminal line of the hindwing wanting) that I have little doubt anatomical research will confirm the status which I give it provisionally.

133. **Phthonoloba titanis incipiens** subsp. n. (Pl. X, fig. 5).

♂, 37–40 mm. Much smaller than *t. titanis*, which expands about 48–53 mm., and with the wings relatively narrower. Altogether less dark. Palpus with the dark scaling generally restricted to a small patch near the base. Abdomen above lighter, only dark-spotted at the ends of the segments. *Forewing* above and beneath with the dark markings slender. *Hindwing* less dark-suffused; cell-spot and postmedian line about as in *t. titanis;* terminal band weaker, at least anteriorly (in the ♀ ♀ obsolete), and not marked beneath by any appreciable subterminal line.

Kamborangah, 7,200 feet, 29 March—4 April, 5 ♂♂, 2 ♀ ♀.

134. **Phthonoloba clauda rufulata** (Warr.)

Hypocometa rufulata Warr., *Nov. Zool.* vi. 339 (1899) (S. Flores).

Marei Parei, 2 ♀ ♀.

The Malayan and Sunda Island forms seem to differ from *c. clauda* (Warr., *Nov. Zool.* iii. 119, Khasis) in having the hindwing less grey (more avellaneous or wood-brown), but I have seen so very few—Gunong Ijau (1), Sarawak (1), S. Java (1), Flores (2)—that I cannot at present be sure of the validity, still less propose further subdivision (cf. *Treubia* vii. 440).

135. **Phthonoloba bostryx** sp. n. (Pl. X, fig. 16).

♂, 37 mm. Head, palpus and thorax bright green; palpus about 3. Abdomen greyish drab, more buff on sides and at extremity; the "keel" below base (cf. *Nov. Zool.* xxxii. 43) obsolete.

Forewing slightly longer than in *decussata* (Moore, 1867) and distinguishable at a glance from all the allies by having a sexual fringe of long yellow-ochre hair on hindmargin, longest in middle; bright yellow-green as in *decussata*, etc., the dark markings rather strong, slightly more reddish brown; subbasal line angled; the next two pairs anteriorly more confluent, the median band more jagged anteriorly than in *decussata;* subterminal lines simple behind, but with the pair of subconfluent wedges distally between the radials fully as strong as in *decussata*. *Hindwing* clothed above with specialized scaling, approximately light greyish olive; fringes yellow-ochre, in part dulled with grey; those of the costal margin distally and of the abdominal margin rather long; that of the tornal region bright, highly specialized, formed of very long coarse hairs and suberect in two series—above and below.

Underside coloured and marked much as in *decussata.*

♀ larger (39 mm.), the hindwing above rather darker, more brownish, the buff fringe dark-spotted.

Lumu Lumu, 5,500 feet, 12–16 April, 4 ♂ ♂ (including the type ♂), 2 ♀ ♀; Marei Parei, 5,000 feet, 29 April and 1 May, 1 ♂, 1 ♀.

136. **Steirophora bathylima** sp. n. (Pl. X, fig. 21).

♂ ♀, 34 mm. Nearly related to *S. mesogrammata* (Walk., 1862), closely agreeing in structure and coloration. *Forewing* of the same vivid yellow-green (cosse green of Ridgway), but relatively rather longer, superficially recalling *Phthonoloba decussata* (Moore); proximal area nearly as in *mesogrammata;* median band well darkened, twice as broad costally as behind, its proximal edge thrice angled inward; outermost line and terminal dots as in *mesogrammata,* distal area otherwise rather clear, except for the subterminal costal spots. *Hindwing* as in the two species named. Underside closely like that of weakly marked *Phthonoloba decussata.*

Lumu Lumu, 5,500 feet, sype ♂; Kamborangah, 7,200 feet, allotype ♀: Marei Parei, 5,000 feet, 2 ♀ ♀.

"*Sauris*" *mesogrammata* Walk., and the present species are clearly referable to *Steirophora* by the venation, but the pouch at the base of the ♂ abdomen beneath is only small, the palpus longer than in typical *Steirophora;* hindtibia of ♂ (as in several species, though not the type) with a pair of short, unequal spurs, femoro-tibial pencil moderate. Virtually *Phthonoloba* with single instead of double areole.

137. **Steirophora fasciata** (Moore).

Remodes fasciata Moore, *Lep. Coll. Atk* 270 (1888) (Khasis).

Lumu Lumu, 1 ♂, 2 ♀ ♀; Kamborangah, 3 ♂ ♂, 6 ♀ ♀: Kiau, 1 ♀.

Variable, the ♀ ♀ possibly representing more than one species. I first determined one of the Lumu Lumu ♀ ♀ as *auratisquama,* but suppose it is a *fasciata*—ab. Whether even the true *auratisquama* Warr. (1897, Java) was anything further is not yet certain; Warren's type, which is small and dark, is not altogether like any other known to me, but the rest of the Javan, together with some from the Malay Peninsula, may well represent a race (or races) of *fasciata.*

138. **Steirophora stigmatephora** sp. n. (Pl. X, fig. 4).

♂ ♀, 45–46 mm. Much larger than the preceding.* Palpus apparently slightly shorter. Thorax posteriorly

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*Even the Kamborangah *fasciata,* which are rather above the average, only reach a maximum of 37 mm.

with pairs of raised black spots. *Forewing* at least as variegated as in the darkest forms of *fasciata*, but not as dark, the palest transverse lines overlaid with shining white; cell-mark strongly black, slightly lunular; lines in part strongly spotted with black, recalling *Phthonoloba titanis* Prout; the black subterminal spots strong, almost confluent. *Hindwing* inclining to light drab, with a touch of cinnamon-drab, at least distally; cell-dot and postmedian well noticeable, a subterminal shade faintly indicated. Underside not so dark as in *fasciata* (varying between snuff-brown and tawny olive), the pale and dark markings better shown than in that species.

Kamborangah, 7,200 feet, 26 March (type ♂) and 30 March (allotype ♀).

The type is a little more yellowish (no doubt by discoloration) than the allotype, which latter has the black spots somewhat heavier.

In both the specimens, R^2 of the hindwing arises before the middle of DC, leaving a minute tract thereof before the inward angle at cell-fold; in *fasciata*, so far as observed, it arises at the angle, exactly opposite the cell-fold. This may well prove slightly variable, but is worth recording.

139. **Steirophora** sp. (? pr. form.)

Kamborangah, 29 March, 1 ♀, defective.

Of about the size and shape of the preceding possibly a remarkable sport thereof, not only in its considerably darker coloration and several small differences in the markings, but still more in the venation of the hindwing, which has SC^2–R^1 quite considerably stalked, instead of separate, and R^2 arising opposite the cell-fold. The palpus is similar and the glittering white scales are developed in places, particularly on the hindmargin of the forewing just proximal to the antemedian line.

140. **Episteira vacuefacta** Prout.

Nov. Zool. xxxvi. 164 (1931) (Kedah Peak).

Kiau, 1 ♂; Marei Parei, 4 ♂♂, 7 ♀♀; Lumu Lumu, 6 ♂♂; Kamborangah 2 ♂♂, 3 ♀♀.

A very variable and interesting series, but I can find no line of demarcation among the specimens catalogued above, nor any ground for separating them from the Kedah representative, which has apparently races in Java and Sumatra. The broad and very weakly marked area between the subbasal line and median area of the forewing, which I stressed in the original description, is often very manifest, but some aberrations have the lines more equally developed in these two areas, bringing it nearer to the little known *delicata* Warr. (1906) of New Guinea, of which it might conceivably prove a race.

Two ♀♀ (Kiau, 4 April; Lumu Lumu, 11 April) seem, on the other hand, so irreconcilable as to call for separate mention, though the absence of the ♂ prevents their being made the basis of a new species. Not only are the dark lines of the forewing strongly (especially in the Lumu Lumu ♀, in which they are also thickened) and pretty uniformly developed from the subbasal to the postmedian (excepting only the usual whitish space between cell-spot and costa) but the subbasal line looks distinctly different—thick instead of fine, the characteristic sharp subcostal angle much blunted and a second obtuse angle formed on SM^2. Moreover the face is paler, the palpus perhaps less extremely long, with its 2nd joint green, beneath partly darkened.

141. **Sauris (Tympanota) arfakensis** Joicey and Talb.

Ann. Mag. Nat. Hist. (8) xx. 68, t. iv. f. 9 (1917) (Dutch New Guinea).

Kiau, 1 ♂; Marei Parei, 3 ♂♂, 11 ♀♀; Lumu Lumu, 1 ♂, 1 ♀; Kamborangah, 1 ♂, 1 ♀.

This species, which has already been taken in some numbers on Kedah Peak (H. M. Pendlebury) but not recorded, varies in size. The Malayan, and perhaps more especially the Kinabalu series, tend to be larger than the Papuan, but I have not thought it necessary to impose any race names.

142. **Sauris (Tympanota) gyiarces** sp. n. (Pl. X, fig. 23).

♂♀, 33–35. Near *arfakensis* (supra), differing as follows:

Palpus of ♂ one-third as long again, of ♀ still longer (at least one-half as long again). Hindleg of ♂ appreciably longer. Forewing of ♂ with margins somewhat straighter. Hindwing of ♂ with a pronounced furrow at the distal end of the lappet, leading to a deeper hindmarginal excavation than in *arfakensis*. Dark markings of forewing in both sexes more uniform, less mixed with black (*e.g.*, scarcely developing the thick, conspicuous band on antemedian from cell to SM^2 which is generally conspicuous.

Kamborangah, 7,200 feet, 2 April (type ♂), 29 and 31 March (allotype and paratype ♀).

In this species and *arfakensis*, the hindwing of the ♂ has SC^2–R^1 shortly stalked, R^2 from before middle of DC, that of the ♀ has R^3–M^1 separate: in *ceramica* and *erecta*, the ♂ has SC^2–R^1 about connate, DC angled, with R^2 about central, the ♀ R^3 –M^1 stalked.

143. **Sauris (Tympanota) ceramica** Rothsch.

Nov. Zool. xxii. 219 (1915) (Ceram).

Lumu Lumu, 1 ♀; Kamborangah, 1 ♂, 1 ♀.

Previously known from Buru, Ceram and Dutch New Guinea.

144. Sauris (Tympanota) erecta (Warr.)

Tympanota erecta Warr., *Nov. Zool.* ii. 108 (1895) (Kinabalu).

Kamborangah, 3 ♂ ♂ ; Pakka, 1 ♂.

So far as I know, has not been again found on Kinabalu since Warren described it from a single ♂, without indication of collector or altitude, in 1895; a ♀ evidently collected with it was overlooked. A single ♀ of a probable race was collected for Mr. Joicey by the Pratts in 1919–20, in Central Ceram, 4,600 feet, but in the absence of the corresponding ♂ has never been described.

145. Sauris (Dystypoptila) triangularis (Warr.)

Dystypoptila triangularis Warr., *Nov. Zool.* ii. 106 (1895) (Padang [recte Padang Rengas, Perak, Malay Peninsula]).

Marei Parei, 1 ♂.

Previously only known from the Malay Peninsula and Java, rare.

146. Sauris nigrifrons Warr.

Nov. Zool. xiv. 163 (20 March, 1907) (British New Guinea).

Sauris protima Turn., *Proc. Linn. Soc. N. Sth. Wales* xxxi (4) 682 (28 March, 1907) (N. Queensland).

Marei Parei, 1 ♀ ; Lumu Lumu, 2 ♀ ♀ ; Kamborangah, 1 ♀.

Already known to me from Assam, Penang and Sarawak. Warren at one time misidentified it as "*nigripalpata* Walk.", at another gave it the manuscript name of *Anisocolpia unilinea* (Penang).

147. Sauris improspera Prout.

Nov. Zool. xxxvi. 164 (1931) (Khasis, etc.)

Marei Parei, 1 ♀.

Not hitherto recorded from Borneo.

148. Sauris usta poeciloteucta subsp. n. (Pl. X, fig. 24).

♂. *Forewing* slightly narrower than in *u. usta* (Warr., *Nov. Zool.* ii. 106, Perak), the small scale-tuft on the underside at the hindward-curved end of SM^2 (not mentioned in Warren's very perfunctory characterization of *Holorista*, *Nov. Zool.* i. 397) darker and perhaps rather better developed, more as in *proboscidaria* (Walk., 1862); lines less "brown," generally rather heavy, though varying according to the individual. *Hindwing* with the "scorched" area behind the middle slightly (type) or considerably brighter, its specialized scaling being more mixed with orange.

♀ variable, the lines of forewing generally weaker than in the ♂, sometimes scarcely at all dark-mixed.*

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*In using Warren's description, it is to be borne in mind that he unaccountably misidentified as *usta* ♀ the ♂ (!) of a *Steirophora*, so that only his ♂ characterization has any validity; vide *Sar. Mus. Journ.* iii. 191, where the record of a specimen from Sarawak may probably refer to the present race.

Lumu Lumu, 5,500 feet, 6–17 April 1929, 5 ♂ ♂, 11 ♀ ♀, including the type and allotype; Marei Parei, 5,000 feet, 2 ♀ ♀; Kiau, 3,000 feet, 2 ♂ ♂; Kamborangah, 7,200 feet, 5 ♀ ♀.

Many especially of the ♀ ♀, are much worn, but I do not see any ground for questioning any of the above records.

149. Sauris hirudinata abortivata (Guen.)

Remodes abortivata Guen., *Spec. Gén. Lép.* x. 364, t. 21, f. 9 (1858) (Borneo).

Remodes lobata Warr., *Nov. Zool.* ii. 107 (1895) (Padang [recte Padang Rengas, Perak, Malay Peninsula])

Lumu Lumu, 1 ♀.

Provisionally regarded as an aberration of this species, but by no means certain; rather small and compact-looking, the hindwing darkish, rather similar to one from Kuching and one from E. Pegu, both in the Tring Museum.

Known range: Ceylon, Assam, Malay Peninsula, Tonkin, Formosa, Borneo; probable or possible races on Celebes, Amboina, Key Is., New Guinea, Louisiades and New Ireland.

150. Sauris interruptata (Moore).

Remodes interruptata Moore, *Lep. Coll. Atk.* 270 (1888) (N. India).
Sauris mirabilis Hmpsn., *Faun. Ind., Moths*, iii. 411 (1895) (E. Pegu).
Lumu Lumu, 1 ♀.

Generally distributed in Ceylon, India, Malay Peninsula, Tonkin, Riu-Kiu Islands, Mentawi, Nias, Sumatra, Java and Borneo. Apparently also in the S. Moluccas and possibly New Guinea.

151. Sauris quassa sp. n. (Pl. X, fig. 22).

♂, 35 mm. Head olive-greenish. Palpus about 2½, blackish, beneath at base white. Antenna not sinuate above; dark. Thorax above greenish; abdomen paler and greyer. Hindleg moderate, not crooked, tibia with a slight terminal tuft above.

Forewing with a moderately deep terminal excision in front of M^2, the lobe behind and the tornus tufted beneath; very variegated, dark greenish olive-buff (no doubt greener when bred), grey and whitish, for the most part rather indefinite and perhaps rendered more so by the not very fresh condition of the specimen; the clear olive-buff basal patch sharply bounded; the alternating olive and whitish lines fairly clear in part, but considerably irrorated with black-grey between M and hindmargin, in anterior part of cell, etc.; a white patch in front of cell-spot, then an extensive area of black-grey irroration between costa and R^3, interruptedly continued to termen, containing about R^1 and R^2 an olive subterminal patch; terminal black-grey vein-spots as far as M^1, those of SC^5 and the radials large.

Hindwing of the general structure-type of *remodesaria* Walk. (1862), a little less shortened; pale drab-grey, with the specialized patches at termen darkened.

Underside drab-grey to drab, the hindmargin of forewing whiter.

Marei Parei, 5,000 feet, 1 May, 1 ♂.

The coloration recalls *aroensis* (Warr., 1903, as *Anthierax*), but the apex is not white, a subapical patch is green and the ♂ of that species has a far larger posterior lobe to the forewing. Two rather poor ♀ ♀ from Penang, without white in the central area, may possibly represent a race or near ally of the present species, but are awaiting their ♂.

152. **Sauris** sp.

Lumu Lumu, 2 ♀ ♀.

Perhaps related to *interruptata* (Moore), but I cannot merge it with that, nor can I venture to describe it without the ♂.

Subfam. GEOMETRINAE.

153. **Ourapteryx incaudata** Warr.

Nov. Zool. iv. 75 (1897) (Kinabalu)

Kiau, 1 ♂; Lumu Lumu, 1 ♂, 1 ♀.

Only further known from Sarawak.

154. **Ourapteryx clara** Butl.

Ann. Mag. Nat. Hist (5) vi. 120 (1880); *Ill. Het.* vi. 50, t. 113, f. 6 (1886) (N. E. Himalayas).

Kiau, 1 ♂; Marei Parei, 1 ♀; Lumu Lumu, 1 ♂.

Known from Sikkim, Assam, the Malay Peninsula and S. E. Sumatra.

155. **Myrteta similaria** Swinh.

Ann. Mag. Nat. Hist. (8) xvi. 183 (1915) (W. Sumatra).

Kiau, 1 ♀; Marei Parei, 3 ♀ ♀; Lumu Lumu, 1 ♂, 4 ♀ ♀; Kamborangah, 1 ♀.

The Kinabalu forms, together with that from Mt. Murud, Sarawak, which I have erroneously recorded (*Sar. Mus. Journ.* iii. 192) as *ocernaria* Swinh., perhaps constitute a mountain race, characterized by the obsolescence of the dark apical patch of the forewing underside. I find the species—which is known from Sumatra, Java, Pahang (Malay Peninsula) and Borneo, with a race in New Guinea (*sublavata* Prout, 1929) differs structurally from *ocernaria* in having the ♂ hindtibia strongly dilated, with hair-pencil and, at least generally, in having the stalk of SC^{1-2} of the forewing less long, so that only SC^1 anastomoses with C, while in *ocernaria* the stalk itself anastomoses (or is connected) therewith.

156. **Tasta micaceata** Walk.

List Lep. Ins. xxvi. 1570 (1862) (Borneo).

Kabayau, 1 ♂; Marei Parei, 1 ♀; Lumu Lumu, 1 ♀.

A local species, perhaps confined to Borneo and the Malay Peninsula. The Khasi *reflexa* Swinh. (1902) and the Celebes *chalybeata* Warr. (1897) are to be regarded as closely allied species rather than races.

157. **Eapta juta** Prout.

Sar. Mus. Journ. iii (9) 192 (1926); t. xvi, f. 3 (1928) (Mt. Murud, Sarawak).

Marei Parei, 1 ♂; Lumu Lumu, 1 ♀; Kamborangah, 4 ♂♂.

I have hitherto only seen the original series. The Kinabalu specimens are on an average rather large, the cell-dot of the hindwing inclined to disappear (but they are all more or lesss worn), the forewing venation rather variable, SC^1 sometimes free, sometimes anastomosing with C, sometimes with SC^2.

158. **Leucetaera luciferata** (Walk.)

Norcia luciferata Walk. xxiv. 1093 (1862) (Borneo).

Marei Parei, 5 ♀♀; Lumu Lumu, 1 ♂, 1 ♀.

For the distribution, see *Sar. Mus. Journ.* iii. 192.

159. **Platycerota percrinita** sp. n. (Pl. IX, fig. 7).

♂♀, 41–47 mm. Head and shadings of abdomen above somewhat infuscated; thorax pale.

Forewing not quite so broad as in *spilotelaria* Walk. (1862); SC^1 anastomosing with C, SC^2 stalked (before SC^3), anastomosing slightly with SC^1 (in the ♂ type its base apparently obsolete on left wing, leaving SC^{1-2} to appear long-stalked); ♂ beneath with large posterior tuft (pencil) of whitish hair; warm buff, in part suffused with cinnamon; some coarse black-grey irroration, especially in the ♂♂, heaviest above the specialized area; antemedian line faint; cell-dot sharply black; postmedian straight, accompanied distally by a pale line; ♀ with a large composite black spot at apex, subterminally reaching R^1, and small irregular blackish distal spots behind M^2. *Hindwing* in ♂ with costal area somewhat expanded, above nacreous white; otherwise concolorous with forewing, the postmedian line continued; ♀ in distal area with paired spots before and behind R^1 and before and behind submedian fold and one close to termen between SC^2 and R^1.

Underside with cell-dots weaker, postmedian line faintly indicated; ♂ whitish behind cell and M^2 of forewing; ♀ with the spots of upperside present.

Kamborangah, 7,200 feet, 25 and 31 March, 2 ♂♂, 3 April, 1 ♀; Lumu Lumu, 5,500 feet, 8 April, 1 ♀.

Nearest to *crinita* Warr. (1897) in the ♂ structure (though that is here exaggerated) and in having postmedian line more oblique than termen, though this line does not run so close to the apex and the apical white dots are lacking; ground colour less bright, etc.

160. **Plutodes cyclaria** Guen.

Spec. Gen. Lép. x. 118, t. 20, f. 3 (1858) (Sarawak).

Kabayau, near Kinabalu, 1 ♀.

See *Nov. Zool.* xxxvii. 12 for the distribution and a possible race.

161. **Plutodes discigera** Butl.

Ann. Mag. Nat. Hist. (5) vi. 223 (1880); *Ill. Het.* vi. 80, t. 119, f. 2 (1886) (Sikkim).

Kiau, 2 ♂♂; Marei Parei, 1 ♂; Kamborangah, 1 ♂.

Known from N. India, Singapore and S. E. China. It is not quite certain that it may not prove a form of the preceding, which is certainly variable, but as I have seen no approach to the true *cyclaria* forms among the Indian material, this seems unlikely. I have described a race of *discigera* from Buru (*P. d. argentispila* Prout, 1929).

162. **Scardamia iographa** sp. n. (Pl. X, fig. 6).

♀, 31–38 mm. Structure and coloration as in the typical (*metallaria* Guen.) group, the palpus perhaps slightly more upcurved.

Forewing with SC^1 long-stalked with SC^2, anastomosing very shortly with C; bright orange, the irroration and strigulation a little more purple than in *rectilinea* Warr. (1896); some ill-defined purplish clouding in posterior part of distal area; cell-mark linear, not very strong; costal margin and lines more purple-mixed than in the allies; lines nearly as in *rectilinea*, the postmedian a little thicker and with a faint curve inward near costa; purplish interneural spots at termen. *Hindwing* with cell-mark shorter and sharper than on forewing; postmedian line continued; a vague subterminal line much as in *bractearia* Walk. (1860) but more purplish; terminal marks more linear than on forewing, more as in *bractearia*. Underside much as in *rectilinea*.

Lumu Lumu, 5,500 feet, 5–13 April, 3 ♀♀, including the type; Marei Parei, 5,000 feet, 28 April, 1 ♀.

163. **Chiasmia strigata commissa** subsp. n.

Less strongly suffused with ochreous than *C. s. strigata* Warr. (1893), at least on the hindwing, which is more variegated and strongly marked. Forewing with the thick antemedian and postmedian lines (or narrow bands) better developed, the latter straighter, consequently more oblique outward at costa, posteriorly coalescent with median; median curved outside the large cell-spot, instead of crossing it; subterminal spots small.

Lumu Lumu, 5,500 feet, 8 April, 1 ♀.

From some notes which I made in 1926 on a ♀ from Batang Padang, Perak, in coll. F.M.S. Mus., that belongs also to this race or an extremely similar one.

164. **Lomographa warreni** nom. n.

Heterostegane quadrilineata Warr., *Nov. Zool.* i. 406 (1894) (nec *Terpnomicta quadrilineata* Snell., 1886) (Perak and Borneo).

Kabayau, near Kinabalu, 1 ♂, small.

As *Terpnomicta quadrilineata* Snell. (Sumatra) is also a *Lomographa*, close to, but distinct from, the present species, a new name is required for the latter.

165. **Peratophyga venetia** Swinh.

Ann. Mag. Nat. Hist. (7) ix. 416 (1902) (Perak; Singapore; Borneo).

Kabayau, 1 ♀; Marei Parei, 1 ♀; Lumu Lumu, 1 ♂.

In addition to the localities given by Swinhoe, I have seen this species from Sumatra. If, as suggested in *Journ. Bom. Nat. Hist. Soc.* xxxi. 787, it is only a race of *hyalinata* (Koll., 1848), a wide range of localities in N. India and China, probably also Japan, must be assigned to it.

166. **Xenostega sobrina** sp. n. (Pl. X, fig. 15).

♂ ♀, 36–38 mm. Face and palpus blackish. Vertex whitish, occiput narrowly fuscous. Antenna in ♂ with moderate pectinations to beyond ½, apical part minutely ciliated; in ♀ serrate, slightly ciliated. Thorax above suffused with grey; abdomen cartridge-buff. Foreleg predominantly dark grey, middle leg darkest on the tarsus; hindtibia moderately dilated, with hair-pencil.

Forewing with fovea in ♂ strong, hyaline, whitish cartridge-buff, with more or less dark irroration, especially in basal and distal areas; costal edge narrowly ochreous, with dark dots or strigulae; median line dark grey, angled outward at base of R^3-M^1 and at SM^2; postmedian represented by dots or extremely short dashes, accompanied about SC^5, R^1, R^3 and M^1 by some cream-buff scaling; proximal subterminal band grey (quaker-drab tinged with dark vinaceous), its proximal edge somewhat sinuous, its distal dentate; dark shades connecting the band with termen at radials and posteriorly; a darker terminal line; fringe clouded. *Hindwing* similar.

Underside slightly more buff, smoother; forewing with slight smoky suffusion in proximal half and with the subterminal band weakly reproduced; hindwing with the subterminal band quite shadowy; both wings with dark terminal line.

Lumu Lumu, 5,500 feet, April, 25 ♂ ♂, 3 ♀ ♀, including the type. Kiau, 3,000 feet, 1 ♂.

Rather variable in depth of colour and strength of markings. On account of the pectinate ♂ antenna, developed fovea and characteristic venation—stalking of SC^1

with SC$^{4-5}$ as well as of R^2 with R^1—falls in the African genus *Xenostega* rather than with the Malayan representatives of the strips.

167. **Synegia botydaria** Guen.

Spec. Gén. Lép. ix. 423 (1858) (Borneo).

Kabayau, near Kinabalu, 2 ♀ ♀.

Distributed in the Malay Peninsula, Sumatra, Borneo and their islands.

168. **Synegia camptogrammaria** Guen.

Spec. Gén. Lép. ix. 420 (1858) (Sarawak).

Marei Parei, 3 ♂ ♂, 9 ♀ ♀; Lumu Lumu, 1 ♂, 1 ♀.

Another ♀ from Lumu Lumu is perhaps a dwarfed ab. of this species.

Range: N. India to W. China, Malay Peninsula, Borneo and Java.

169. **Synegia asymbates** sp. n. (Pl. XI, fig. 11).

♂. 34 mm. Similar to some forms of *imitaria malayana* Prout (1925), but more approaching the clear yellow tone of *botydaria* Guen., on account of the diminution of the ochraceous irroration. *Forewing* slightly less narrow than in *i. malayana*, with costal border a little darker and broader, cell-dot intenser; yellow band outside the postmedian broader, the proximal subterminal shade forming a line rather than a band. *Hindwing* relatively large; a well-defined subterminal band (in *imitaria* blurred, only with a conspicuous spot posteriorly); postmedian more outbent in the middle—particularly noticeable on the underside; cell-dot and outer yellow band about as on forewing. Marei Parei, 5,000 feet, 28 April, 1 ♂.

A ♀ from Gunong Ijau (= "*Syntaracta varians* .... the lightest" of Warren, *Nov. Zool.* i. 409, *err. det.*) is clearly a form or race of the present species and I have long had it separated over a blank label, awaiting the ♂; it is a little lighter, with some greyish suffusion on the postmedian distally, (especially on the projections), etc.

170. **Synegia ocellata** (Warr.)

Syntaracta ocellata Warr., *Nov. Zool.* i. 408 (1894) Perak: Gunong Ijau).

Marei Parei, 2 ♂ ♂, 1 ♀; Lumu Lumu, 3 ♂ ♂, 3 ♀ ♀; Kamborangah, 11 ♂ ♂, 8 ♀ ♀.

A fine series, including a few handsomely suffused or clouded aberrations. I regard Warren's "♀ type" as the holotype, as his only ♂ ("♂ type") belongs to the *maculosata*-like form which is described as an "ab."

Only known further from Sarawak (the ♀—ab. recorded from Mt. Murud in *Sar. Mus. Journ.* iii. 194) and W. Java.

171. Synegia (Eugnesia) decolorata (Warr.)

Eugnesia decolorata Warr., *Nov. Zool.* x. 383 (1903) (British New Guinea).

Lumu Lumu, 1 ♂, 1 ♀.

I have long known this species from Malaya, one of the unfortunate group of specimens from Gunong Ijau "lumped" by Warren (*Nov. Zool.* i. 409) as *Syntaracta varians* belonging to it. I can see no distinction between these western forms and those which are distributed in New Guinea, the D'Entrecasteaux and the Louisiades.

172. Borbacha pardaria (Guen.)

Anisodes pardaria Guen., *Spec. Gén. Lép.* ix. 420 (1858) (Borneo).

I have given the range, so far as known to me, in *Sar. Mus. Journ.* iii. 194.

173. **Heterostegania balia** sp. n. (Pl. IX, fig. 6).

♂ ♀, 43-48 mm. Head zinc-orange or slightly more reddish. Palpus extending very little beyond frons. Patagia variegated, yellow and orange. Thorax above predominantly orange, abdomen more brown or (posteriorly) drab; both beneath cartridge-buff to cream-buff.

Forewing warm buff clouded with zinc-orange or apricot-buff (variable, in the type ♂ having the buff suppressed), so extensively clouded with vinaceous brown as to leave only the following patches of the ground-colour: a small basal patch; a moderate midcostal one, containing the blackish cell-dot; an antemedian stripe from costa to near SM^2, divided by M into two spots, the anterior the longer; a roundish apical-costal patch, much as in *lunulosa* (Moore, 1888): a small postmedian spot between M and SM^2, generally succeeded distally by some ill-defined blackish clouding. *Hindwing* concolorous, the ochraceous brown proximal half containing the black cell-dot; ground-colour showing on an ill-defined, somewhat variable band, which is generally narrow at costa and hindmargin but has a very ample, equally ill-defined central projection to (or almost to) the termen.

Underside much paler and less variegated, the markings, faint excepting the apical-costal of forewing.

Kamborangah, 7,200 feet, April, type ♂ and 2 ♀ ♀. Lumu Lumu, 5,500 feet, 1 ♂, 1 ♀.

The genus *Heterostegania* was previously known only from N. India, Burma and W. to Central China.

174. Hypochrosis pachiaria (Walk.)

Omiza pachiaria Walk. xx. 247 (1860) (N. India).

Kenokok, 2 ♂ ♂.

The name-typical race is distributed in India and reaches the Andamans and Hainan. A well differentiated race, *p. obnubilata* Prout (1922) replaces it on Ceram, Buru, etc. The Kenokok specimens are certainly nearer to the former, but may be racially separable by the strengthened subcostal maculation of the forewing or some other detail.

175. **Hypochrosis heroïs** sp. n. (Pl. IX, fig. 12).

♂, 55 mm. Near *pachiaria* (Walk.). *Forewing* with termen slightly more oblique; colour much warmer (light orange-yellow instead of mustard-yellow or colonial buff), only paler-mixed terminally; lines more reddish and—except in front of R^1—rather thicker and marked with white-grey vein-spots; antemedian at costa with a larger white-grey dark-edged spot; cell-mark much reduced; subterminal cloud obsolete; apical mark strongly dark-edged. *Hindwing*, except the whitish-yellow costal border, concolorous with forewing, in places more coarsely freckled; cell-dot much darker and larger than in *pachiaria*, the transverse line wanting; strong subbasal and postmedian marks at abdominal margin. Underside yellow, but with stronger orange irroration and suffusion, especially on forewing proximally and costally; markings of upperside here more orange; cell-spot of forewing much smaller, of hindwing rather stronger than in *pachiaria*, the former not ocellated.

♀, 65-66 mm. Similar to ♀ *p. obnubilata* Prout (1922). Pectinations considerably longer, nearly as in the ♂. Abdomen beneath, except at base, strongly suffused with capucine yellow to orange. Ground-colour of wings less orange than in *p. obnubilata* ♀, more honey-yellow, the dark parts darker; borders heavy; distinctions in the lines and cell-dots analogous to those of the ♂.

Lumu Lumu, 5,500 feet, 6–11 April, 1 ♂ (type), 3 ♀ ♀ (including allotype); Marei Parei, 5,000 feet, 1 ♂, 1 ♀; Kiau, 3,000 feet, 1 ♂.

176. **Hypochrosis tinctaria bebaea** subsp. n.

♂, 32-35 mm. A little larger than *t. tinctaria* (Walk., 1862, N. India), above nearly agreeing with the occasional aberrations of that race in which the proximal and distal areas are pretty uniformly suffused with purplish grey, but rather more strongly irrorated with minute dark strigulae; cell-ring relatively large. Underside deeply coloured, the yellow part of the forewing almost as orange-buff as the hindwing and much spotted with purple; hindwing generally more irrorated than in *t. tinctaria*, in three examples showing an incomplete central line which is scarcely ever indicated in the type race.

Lumu Lumu, 5,500 feet, 11–29 April, 14, including the type; Marei Parei, 5,000 feet, 26; Kenokok, about 3,300 feet, 1; Kiau, 3,000 feet, 12.

There has also stood in the Tring Museum with *H. t. korndörfferi* (Snell., 1877, Sumatra) a series of 12 from

Kinabalu. They are smaller than the Sumatran race, the angle of the postmedian rather less extreme, generally shorter, the coloration above much less varied and variable. Indeed the material now available points to the Kinabalu race as very constant, though the maculation of the underside varies in size.

177. **Hypochrosis festivaria** (Fb.)

Phalaena festivaria Fb., Ent. Syst. iii (2) 152 (1794) (sine loc. [? India]).

Marei Parei, 1 ♀.

Widely distributed in India and Ceylon, Hong Kong, Penang, Java and N. Borneo. I have not yet been able to make out any definite racial tendencies.

178. **Hypochrosis callopistes** sp. n. (Pl. XI, fig. 26).

♂, 31 mm. Near *pulchraria* Rothsch. (1894). Smaller, somewhat shorter-winged, the apex of the hindwing appreciably better rounded. Ground-colour rather paler, the abdomen with the dorsal spot double, sharply defined, clay-colour, a narrow lateral stripe slightly paler (cinnamon-buff). *Forewing* with the green band less extremely oblique, the costal area in front of it more suffused with bright fawn-colour, the antemedian costal spot vandyke-brown, not green; some slight differences in the distal maculation. *Hindwing* with the proximal markings weaker and less green. Underside with the red suffusions rather restricted, the forewing with a large subtriangular dark-grey suffusion from behind M (just proximal of M^2) to termen between R^4 and SM^2, at termen a little less dark and with a narrow anterior extension almost to apex, diminishing in intensity.

Kabayau, near Kinabalu, 600 feet, 10 April, 1 ♂.

179. **Hypochrosis albodecorata** Swinh. (?)

Tr. Ent. Soc. Lond. 1902, p. 608 (Borneo [Mt. Dulit]).

Lumu Lumu, 3 ♀ ♀ : Kiau, 1 ♀.

As Swinhoe's *albodecorata* was based on a single ♂, which has remained unique, I am unable to decide whether the Kinabalu insect represents the normal ♀ form or a race or close ally, or whether the type was biologically an aberration. These ♀ ♀ have the brown rather brighter and suffusing the whole forewing except the white edgings of the median markings.

180. **Hypochrosis sternaria** Guen.

Spec. Gén. Lép. x. 537 (1858) (Central India).

Omiza schistaria Moore, *Proc. Zool. Soc. Lond.* 1878, p. 851, t. 53, f. 12 (Upper Tenasserim).

Patruissa sternaria ab. *insulata* Warr., *Nov. Zool.* xvi. 126 (1909) (Borneo: Kuching).

? *Patruissa subrufa* Bastelb., *Ent. Zeit.* xxii. 61 (1908) (Borneo)?

Marei Parei, 2 ♀ ♀.

I cannot accept the synonymy given by Hampson, *Faun. Ind., Moths* iii. 173. *Patruissa pyrrhophaeata* Walk. (1862) and *Geometra* (?) *binexata* Walk. (1862) (= *Plutodes glaucaria* Snell., 1880) are evidently distinct species, and it is to the last-named, not to *sternaria*, that "ab. *ocellata*" (Warr. 1894) belongs, while the confusion has further led Warren to redescribe the typical form of *sternaria* as "ab. *insulata*." True *sternaria*, which is by no means common, is best known from Upper Tenasserim and Borneo.

181. **Hypochrosis lycoraria** Guen.

Spec. Gén. Lép. x. 538 (1858) (Borneo).

Hypochrosis jasminaria Guen. *ibid.* ("East Indies")

Decetia hypopyrata Snell., *Iris* viii. 146 (1895) (N. E. Sumatra).

Kenokok, about 3,300 feet, 1 ♂.

Already recorded from Kinabalu by Warren (*Nov. Zool.* viii. 200). Further known from Siam, the Malay Peninsula and Sumatra.

182. **Sabaria rigorata** sp. n. (Pl. XI, fig. 12).

♂, 34 mm. Face reddish brown. Vertex pale, almost whitish. Body light cinnamon-drab, the thorax above in part more vinaceous-fawn, beneath in part (especially fore-coxa) cinnamon, the abdomen laterally in part tinged with cinnamon.

Forewing about as narrow as in *semifulva* (Pagenst., 1886), termen without special bend at R^3; SC^1 from the base of SC^2, connected by bar with C, R^2 slightly before middle of DC, M^1 widely separate; light cinnamon-drab, without irroration or strigulation; costal edge narrowly more red-brown; lines walnut-brown, almost straight, antemedian fine, postmedian thick and strong. *Hindwing* ochraceous-buff or very slightly more orange, behind SM^2 concolorous with forewing and with continuation of its walnut-brown postmedian, which anteriorly is only faintly indicated in orange and fades out entirely at the radials.

Both wings beneath coloured nearly as hindwing above, the postmedian present, on forewing quite weak, on hindwing better developed, especially at costa, curved nearly parallel with termen.

Marei Parei, 5,000 feet, 2 May, 1 ♂.

183. **Heterolocha falconaria** (Walk.)

Aspilates falconaria Walk. xxxv. 1665 (1866) (N. India).

Marei Parei, 1 ♂ ; Lumu Lumu, 3 ♂ ♂.

Previously recorded range: N. W. India to Burma (*Journ. Bomb. Nat. Hist. Soc.* xxxi. 790) ; also, if *iobaphegrapha* Wehrli (1924) be conspecific, E. China. The Kinabalu species should prove a separable race.

184. **Callerinnys statheuta** sp. n. (Pl. XI, fig. 18).

♂, 37 mm. Nearly related to *combusta* (Warr., 1893) but readily distinguished as follows.

Hindtibia densely fringed with hair. Wings rather more elongate. *Forewing* with termen perhaps rather more irregular in shape; cell rather longer; markings much as in the weakest-marked *combusta.*

Hindwing very distinct, the median line (crossing the cell-dot) almost straight, the postmedian sinuous, markedly excurved between the folds, accentuated throughout by large grey dots on the veins, the warm shadings slight. Underside similar to upper.

Marei Parei, 5,000 feet, 2 May, 1 ♂.

185. **Hypulia strictiva** sp. n. (Pl. XI, fig. 24).

♂, 29 mm. Smaller and less long-winged than the ♂ of *continua* (Walk., 1861). *Forewing* with apex not produced, termen not gibbous in the middle; the faint postmedian posteriorly less oblique than termen, reaching hindmargin near tornus. *Hindwing* with termen little convex, very feebly bent between R^3 and M^1, tornus pronounced; specialized scaling of underside weaker than in *continua* and quite differently placed, occupying a tapering area between radial fold and tornus; a faint line or shade continuing the antemedian of forewing. Underside with forewing and specialized area of hindwing more greenish (olive) than the rest of hindwing.

Near Kinabalu, Koung, 1,300 feet, 15 March, 1 ♂.

The ♀ ♀ which evidently belong to this species have hitherto been passed over as forms of *continua* with non-falcate, non-gibbous forewing and less convex termen of hindwing, but further differ in the more distinct lines, that of the hindwing—though much less proximally placed than in *strictiva* ♂—straighter, inclining to approach tornus posteriorly instead of curving parallel with termen. Known to me from Matang Rd. (Sarawak); Singapore and Bukit Kutu (Selangor). No "reddish ochreous" (light fawn-coloured) form of this species is yet known.

186. **Nadagara synocha** Prout.

Nov. Zool. xxx. 213 (1923) (Malay Peninsula, Java, Sumatra).

Marei Parei, 3 ♂ ♂, 1 ♀; Lumu Lumu, 2 ♀ ♀.

187. **Bulonga schistacearia** Walk.

Journ. Linn. Soc. Zool. iii. 193 (1859) (Singapore).

Kabayau, near Kinabalu, 1 ♀.

Well distributed in the Malayan subregion; see *Nov. Zool.* xxxvii. 14.

The rare "*Bulonga*" *trilineata* Bastelb. (1905), apparently a speciality of Kinabalu, was not met with. I suppose it is a *Plesiomorpha* rather than a *Bulonga*,

188. **Luxiaria amasa fulvifascia** Warr.

Luxiaria fulvifascia Warr., *Nov. Zool.* i. 440 (1894) (Sumatra).

Lumu Lumu, 2 ♂ ♂, 2 ♀ ♀.

Already known from Sumatra, Malay Peninsula and Borneo. Other races inhabit Celebes, N. India, China, Corea, Japan and Formosa.

189. **Luxiaria acutaria** (Snell.)

Boarmia acutaria Snell., *Tijd. v. Ent.* xx. 75, t. vi, f. 1 (1877) (Sumatra).

Kiau, 1 ♂; Marei Parei, 3 ♂ ♂, 5 ♀ ♀; Lumu Lumu, 2 ♀ ♀.

Range: N. India, Malay Peninsula, Sumatra and Borneo.

190. **Luxiaria tephrosaria ichnaea** subsp. n. (Pl. X, fig. 13).

♂ ♀. On an average larger than *t. tephrosaria* (Moore, 1867). Ground-colour less dusted, thus looking rather more yellowish. Forewing with the dark costal spots reduced or obsolete. Underside with the markings more cinnamon, the postmedian of the hindwing weak, with the spots outside it pinkish cinnamon, entirely or almost entirely unmixed with grey.

Lumu Lumu, 5,500 feet, April, 12 ♂ ♂, 1 ♀, including the type; Marei Parei, 8 ♂ ♂, 5 ♀ ♀; Kamborangah, 1 ♂.

A few specimens are of the frequent ab. with a large spot at hinder end of the postmedian of the forewing.

191. **Luxiaria mitorrhaphes** Prout.

Nov. Zool. xxxii. 64 (1925) (Assam).

Marei Parei, 2 ♀ ♀; Lumu Lumu 1 ♀.

Seem to be a small form of this species, which inhabits N. India, Tonkin, China and Formosa.

192. **Luxiaria subrasata** (Walk.)

Acidalia subrasata Walk. xxiii. 773 (1861) (Borneo).

Marei Parei, 1 ♂; Lumu Lumu, 3 ♀ ♀; Kamborangah, 1 ♂.

Best known from N. India and Borneo; no doubt also in the Malay Peninsula and perhaps Sumatra. A race in New Guinea and D' Entrecasteaux.

193. **Luxiaria submonstrata** (Walk.)

Acidalia submonstrata Walk. xxiii. 772 (1861) (Sarawak).

Lumu Lumu, 1 ♂, 1 ♀; Marei Parei (? 1 ♂), 3 ♀ ♀.

The ♂ from Marei Parei is aberrant, unless it belongs to a different species. It has a very clear white apical patch on the forewing beneath and looks much like the most strongly marked examples of *Euippe fictaria* Prout (1926), except that the termen of the forewing is not excavated.

L. submonstrata is often common in the Malay Peninsula and Borneo and I have described a race from Celebes. I am inclined to think *inferna* (Warr., 1903, as *Euippe*), which represents it in New Guinea a distinct species.

194. Luxiaria subgravata sp. n. (Pl. X, fig. 12).

♂, 36-39 mm; ♀, 34 mm. Face brown, narrowly whitish below. Palpus in both sexes rather short (about 1⅓); brown, pale beneath. Antenna of ♂ with short, even ciliation (considerably less long than diameter of shaft); of ♀ simple. Head and body concolorous with wings; abdomen in places (especially laterally) with irregular black spots or dots. Foreleg with coxa partly buff, the rest pale, irrorated and mottled with black; mid- and hindlegs predominantly pale; hindtibia of ♂ dilated with hair-pencil, abdominal spine short and slender.

Forewing shaped about as in *postvittata* (Walk., 1861); venation similar (SC^{1-2} coincident, anastomosing slightly or connected with C); whitish, the suffusions more inclining towards tilleul-buff than yellowish, the ill-defined band between postmedian and subterminal approaching vinaceous buff; some dark irroration; 3rd. (postmedian) costal spots relatively large; cell-spot brown, not intense; lines much as in *postvittata*, the postmedian more sinuous, at M^2 bent, reaching hindmargin very near median, the subterminal also a little more irregular than in *subvittata*. *Hindwing* scarcely so strongly angled as is *subvittata*, in the ♀ quite weakly so; cell-mark more blackish than on forewing set on a bed of dark irroration which does not reach costa; otherwise nearly as in well-marked *postvittata*.

Underside coloured more as in *iotaria* (Field., 1875). Forewing with the incomplete median and more complete postmedian fuscous, not brown, the latter completely double—dots proximally, a line distally—thickened and blackened anteriorly, the dot at costa, the line at subcostals. Hindwing with the cell-mark larger than in *iotaria* and the postmedian conspicuous, heavier anteriorly than posteriorly.

Lumu Lumu, 5,500 feet, 7 April (type ♂ and allotype ♀) and 8 April (paratype ♂); Marei Parei, 5,000 feet, 28 and 29 April, 2 ♀ ♀.

Presumably the closest ally is the little-known *postlunata* Prout (1928, S. W. Sumatra), which has the costa of forewing more arched, the tone somewhat different, the pale lines distally to the postmedian—notably on the hindwing—much more crenulate, and some differences on the underside.

195. Luxiaria exclusa (Walk.) (form ?).

Hemerophila (?) *exclusa* Walk. xxi. 321 (1860) [Burma: Moulmein].

Marei Parei 1 ♂.

The specimen has the tail of the hindwing weak and is weakly marked, somewhat suffused. Possibly a separate species, but a specimen from Pulo Laut has some points in common with it and is clearly *exclusa*.

Distributed from Ceylon to Java and Borneo, with races in the Moluccas, the Papuan subregion and perhaps Fiji (*sesquilinea* Prout, 1930).

196. **Eutoea heteroneurata** (Guen.)

Cassyma heteroneurata Guen., *Spec. Gén. Lép.* x. 19 (1858) (Borneo).

Marei Parei, 2 ♂♂, 1 ♀; Lumu Lumu, 1 ♂.

Distributed, with little variation (except the sexual) from India to New Guinea, represented in the Bismarcks by *h. bismarckensis* Prout (1926).

197. **Calletaera subexpressa** (Walk.)

Acidalia subexpressa Walk. xxiii. 773 (1861) (Sarawak).

Kabayau, 1 ♀; Marei Parei, 1 ♀.

I have published the known distribution in *Nov. Zool.* xxxvii. 15.

198. **Zamarada scriptifasciata** (Walk.)

Comibaena scriptifaciata Walk. xxvi. 1567 (1862) (Sarawak).

Lumu Lumu, 1 ♂.

Range: Java, the Malay Peninsula, Borneo.

199. **Krananda vitraria** Feld.

Reise Novara, Lep. Het. t. 128, f. 32 (1875) (Java).

Kabayau, 1 ♀; Marei Parei, 1 ♀.

Known also from India and the Malay Peninsula.

200. **Zeheba lucidata** (Walk.)

Macaria (?) *lucidata* Walk. xxvi. 1651 (1862) (Sarawak).

Marei Parei, 1 ♀.

A widely distributed Indo-Malayan species, with probably some geographical variation. I have not yet satisfied myself whether Hampson and Turner are right in sinking *spectabilis* (Butl., 1877), from N. Australia, New Guinea, etc.; it is in any case very closely related.

201. **Semiothisa emersaria** (Walk.)

Macaria emersaria Walk., xxiii. 925 (1861) (India).

Lumu Lumu, 1 ♂.

I have given the ascertained range in *Nov. Zool.* xxxvii. 15.

202. **Semiothisa ozararia** (Walk.)

Evarzia ozararia Walk. xx. 274 (1860) (Borneo).

Marei Parei, 2 ♂♂, 1 ♀; Lumu Lumu, 1 ♂.

This species is represented also in India and Hainan, by the race *perspicuaria* (Moore, 1867).

203. **Semiothisa hygies** sp. n. (Pl. X, fig. 8).

♂, 40 mm. Face-cone slight. Palpus just over 1½, dark-mixed on outerside. Antennal ciliation about 1. Body concolorous with wings, the head and front of thorax more cinnamon-brown. Hindtibia scarcely dilated.

Forewing with fovea moderate; SC$^{1-2}$ coincident, free; light pinkish cinnamon, dulled towards avellaneous by faint suffusions and strigulations of olive-greyish; lines commencing from outwardly oblique brown costal marks, strongly angled subcostally, becoming fainter and greyer; antemedian angled inward on M, then excurved; a double fuscous line beyond the postmedian, mostly heavy, its inner element curving strongly at R^1 and becoming faint, joining the postmedian costal spot; a warm suffusion at base of costa; ill-defined cinnamon-rufous subterminal maculation at costa, followed by a whitish spot; terminal line interrupted anteriorly, punctiform posteriorly; fringe dark-mottled. *Hindwing* with cell-dot small; proximal line much as in *ozararia* (Walk., 1860); double fuscous line of forewing continued; blackish-fuscous subterminal spots and irroration from R^4 hindward; termen with interneural dots.

Underside whitish, with coarse and copious dark irroration; costal border and veins with cinnamon-buff suffusion; cell-dots present, a thick sinuous line just beyond on forewing, just proximal on hind; postmedian fine, succeeded by a very broad shade, party fuscous, partly orange-cinnamon, on forewing reaching termen except for a triangular white apical spot, on hindwing pretty solid for a width of 3.5 mm. (some white enclosed near abdominal margin), distally only continued to termen by some vein-streaks (broad on R^1 and R^4) and some irroration.

Near *ozararia* (Walk.) and *exsuperans* (Prout, 1923), though with simpler wing-shape; upperside much as in the former, underside, at least in coloration, curiously reminiscent of some African species (*amarata* Guen., 1858, etc.)

204. **Semiothisa fulvida** (Warr.)

Azata fulvida Warr., *Nov. Zool.* xii. 433 (1905) (Hainan).

Kabayau, near Kinabalu, 1 ♀.

I have records from India, the Malay Peninsula and Borneo. The group has not yet been at all thoroughly worked out, but in any case these forms without ♂ hind-tibial hair-pencil cannot be left united with *perfusaria* (Wall., 1866), which has the pencil.

205. **Hyposidra talaca** (Walk.)

Lagyra talaca Walk. xx. 59 (1860) (Celebes).

Kabayau, 1 ♂.

Very generally distributed from Ceylon to Melanesia.

206. **Hyposidra apioleuca** Prout.

Nov. Zool. xxiii. 209 (1916) (Sumatra).

Marei Parei, 1 ♂.

This species was already represented from Kinabalu in the Tring Museum.

207. **Hyposidra violescens** Hmpsn.

Faun. Ind., Moths, iii. 213 (1895) ("Sikkim" [Bhutan]).

Marei Parei, 4 ♂ ♂.

Hampson's type was labelled Bhutan, but most of the known material is from Sumatra or Sarawak. *H. plagosa* Rothsch. (1915), from the Snow Mountains, Dutch New Guinea, is a nearly related but distinct species.

208. **Hyposidra apona** sp. n.

♂, 36 mm. Palpus reaching very little beyond frons. Tongue rather strong for a *Hyposidra*. Antenna with the pectinations very long (typical), but with a slightly longer apical part non-pectinate than in *infixaria* (Walk.) and *violescens* Hmpsn. Vertex of head and base and tip of abdomen a little paler than most of head and body.

Forewing with apex not noticeably falcate, the strongly oblique termen having only a quite shallow concavity between R^1 and M^1 and slight undulations throughout; SC^1 and SC^2 both from cell, R^2 about central, DC less strongly incurved than in many *Hyposidra*, fovea strong behind fold, a bar between fold and base of cell recalling that of *Semiothisa*; dusky drab to fuscous, anteriorly paler (largely mixed with an indeterminate buff), with a cinnamon-buff to cinnamon cloud between postmedian and subterminal from costa about to R^1; cell-dot rather small; pale anterior part of the forewing from base to postmedian of about the same extent as in *Lophobates ochricostata* (Hmpsn., 1898), though less strikingly contrasted; median line rather thick at costa opposite cell-dot, then sharply curved to join the dark area; postmedian from 5/7 costa, slightly oblique inward, scarcely traceable between the radials, between R^3 and SM^2 rather strongly incurved, at hind-margin scarcely 3/5 from base; pale distal edging to the stronger parts of this line; subterminal white, interrupted, slightly macular at first, extremely fine between SC^5 and R^2, then forming two definite spots, the larger between R^3 and M^1, posteriorly again extremely fine; terminal line rather weak, but somewhat thickened midway between the veins. *Hindwing* with termen waved, from R^1 to M^1 more crenulate, the strongest tooth (as in *violescens*) at M^1, but much less developed than in that species; proximally whitish, a broad distal band dusky drab, at costa almost reaching the postmedian and unicolorous, gradually narrowing a little, posterior half marked with a rather thick white subterminal, which runs to tornus and is shaded proximally with some brown suffusion; cell-dot small; a sinuous median line between cell-fold and abdominal margin; a somewhat irregular, lunulate-dentate postmedian, strongest posteriorly, between fold and SM^2 rather strongly oblique outward.

Kenokok, 3,300 feet, 26 April, 1 ♂.

In venation nearest *infixaria;* in *violescens*, which agrees better with it in shape, SC^1 and SC^2 of the forewing are shortly stalked, as in most *Hyposidra* ♂♂, and M^1 of both wings is almost connate with R^3.

209. **Petelia medardaria** H-Sch.

Aussereur. Schmett. i, t. 94, f. 534 (1856) (East India).

Kiau, 1 ♂.

For the distribution, see *Nov. Zool.* xxxvii. 16.

210. **Petelia immaculata** Hmpsn.

Ill. Het. ix. 140, t. 168, f. 6, 12 (1893) (Ceylon).

Lumu Lumu.

Distribution nearly as in the preceding.

211. **Petelia paroobathra** sp. n. (Pl. X, fig. 14).

♂, 40 mm. Close to *immaculata* Hmpsn., possible a very outstanding form thereof. *Forewing* slightly narrower, ecru-drab to drab-grey, with proximal area strongly, though not quite regularly, suffused with pecan-brown and showing a blackish dot at hindmargin; median line rather more sinuous; cell-dot sharp, black; distal almost unmarked, except for a strong pecan-brown subcostal spot; slight subcostal suffusions midway between this spot and median line and again towards apex. *Hindwing* with similar proximal suffusion, on which stands the small but sharp buff cell-spot; the proximal line feebly indicated, as also some faint postmedian maculation, formed much as in *immaculata*. Underside closely as in *immaculata*.

Marei Parei, 5,000 feet, 28 April 1929, 1 ♂.

A race (?), with the brown parts more cinnamon above, the dark markings rather stronger beneath, has long stood unnamed in the Tring Museum—5 ♂♂ from Padang Rengas, 2 ♂♂ from Gunong Ijau (Perak).

212. **Petelia delostigma** sp. n. (Pl. IX, fig. 10).

♀, 45 51 mm. Face brown. Palpus elongate, more fuscous, pale at base, 2nd joint compactly scaled, 3rd joint longer than in the allies (well over ½). Vertex white. Thorax and abdomen concolorous with wings, or in part paler. Forefemur blackish above.

Forewing with SC^1 free; coloration and scheme of markings as in *medardaria* and *immaculata*; cell-dot larger; strigulation and maculation at base of costa strengthened, giving birth to a fairly strong, sinuous antemedian line, which ends in a strong hindmarginal spot; median line brown, weak more proximal than in the allies and less straight; subterminal, as in some *medardaria* and *immaculata*, with an ill-defined blackish W between SC^1 and R^1, accompanied proximally by bright ochraceous spots;

terminal dots very small. *Hindwing* weakly marked, except for two (perhaps inconstant) black spots at M¹; cell-dot clear, cream-colour, surrounded with ochraceous buff.

Underside rather more strongly sprinkled than in average *medardaria*, the dark borders rather weaker; cell-spot of forewing less large, about as in some *immaculata*; no other markings except the minute terminal dots.

Lumu Lumu, 5,500 feet, 8–10 April, 3 ♀ ♀, including the type; Kiau, 3,000 feet, 2 May, 1 ♀.

213. **Petelia metaspila** (Walk.).

Astygisa metaspila Walk., *Journ. Linn. Soc. Zool.* vi. 193 (1861) (Sumatra).

Kabayau, near Kinabalu, 2 ♂ ♂.

The name-typical form, so far as I know, is almost confined to Borneo, though one or two Malay examples come very close to it. *P. m. subaurata* Prout (1928), from Sumatra, erected as a race, perhaps meets it in the Peninsula. Little material, however, is yet to hand.

214. **Eurychoria perata trajecta** subsp. n. (Pl. IX, fig. 3).

♂, 44–48 mm. Differs from *p. perata* Prout (*Bull. Hill Mus.* ii. 142, S.W. Sumatra) in having the apical irroration of the forewing beneath better developed, fully 6 mm. broad at the radials and more or less extending along the costal margin, the border of the hindwing, on the contrary, obsolete or much reduced, in the most heavily marked specimen scarcely 1 mm. in width. Upperside probably as variable as in the allies, the median line in all the examples strong, blackish, being in one ab. the only prominent marking; in others (one of which has been chosen type) heavily clouded with blackish, particularly, on the tornal quarter of the hindwing, and with all the lines developed, though not sharply defined.

Lumu Lumu, 5,500 feet, 10–12 April, 5 ♂ ♂, including the type; Kiau, 3,000 feet, 2 May, 1 ♂.

215. **Fascellina plagiata** (Walk.).

Geometra plagiata Walk. xxxv. 1601 (1866) (Sikkim).

Lumu Lumu, 4 ♂ ♂.

To the localities given in *Sar. Mus.* Journ. iii. 197, should be added Java.

216. **Fascellina albicordis** sp. n. (Pl. IX, fig. 5).

♂, 44 mm. Head and body above somewhat fuscous, glossed with slate-grey, the patagia (especially at tips) and sometimes part of the abdomen paler and browner; beneath light orange-yellow, the abdomen laterally deepening to orange.

Forewing with termen appreciably sinuate between M² and SM², but more weakly than in *chromataria* Walk. (1860), the distal sinus of hindmargin also weakened, the lobe at tornus consequently reduced; colour variegated; the general arrangement much as in *chromataria*, but with the clear brown parts less reddish (more approaching snuff-brown), the suffusions slate-colour rather than violaceous; costal spots smaller and less pale (more irrorated) than in *chromataria*; no pale band indicated outside the postmedian, the shading being here slaty; a large and conspicuous white cell-spot. *Hindwing* with apical excision weaker than in *chromataria*; concolorous with forewing, the postmedian dots rather more distally placed than in that species.

Forewing beneath less reddened than in *chromataria*, the light suffusions being yellowish rather than vinaceous, the brown shades not red-brown; the characteristic white cell-spot well visible; the narrow brown band beyond it not produced to a point on SC^5. Hindwing beneath proximally light orange-yellow, distally more suffused with orange, but with no definite demarcation of colour; postmedian line (distinct only from costa to SC^2 or R^1) more distally placed than the still fainter line of *chromataria*, slightly incurved between R^1 and M^1; subterminal only developed from costa to R^1, where it joins a somewhat curved purplish grey shade which runs from termen at SC^2 to R^1.

Lumu Lumu, 5,500 feet, 7 April (type) and 5 May (paratype).

217. **Fascellina inconspicua** Warr.

Nov. Zool. i. 446 (1894) ("Padang" [recte Padang Rengas, Perak, Malay Peninsula]).

Kabayau, near Kinabalu. 1 ♂.

According to Swinhoe (*Tr. Ent. Soc. Lond.* 1902, p. 612) this is identical with *subsignata* Warr. (1893) from N. E. Himalaya; he may probably prove right as regards its specific identity, but I think it is at least a race.

218. **Fascellina clausaria** Walk.

List Lep. Ins. xxxv. 1556 (1866) (Sumatra).

Kabayau, near Kinabalu, 1 ♂.

Known also from the Malay Peninsula and Siam. The synonymy given by Swinhoe in *Cat. Lep. Het. Oxf. Mus.* ii. 257 is inaccurate, but has been emended by the same author in *Tr. Ent. Soc. Lond.* 1902, p. 612.

219. **Garaeus apicata** (Moore).

Auzea apicata Moore, *Proc. Zool. Soc. Lond.* 1867, p. 617 (Sikkim).

Marei Parei, 1 ♂; Lumu Lumu, 2 ♂ ♂; Kamborangah, 2 ♀ ♀.

Perhaps a separable race, but the species is everywhere variable; on the whole the Kinabalu specimens are nearer to the name-typical than is a dubious form from Bukit Kutu, Selangor, which I therefore expect will prove a separate species. *G. apicata* proper extends from N. W. India to Burma and has a race on Formosa.

220. **Dalima patularia** (Walk.).

Omiza patularia Walk. xx. 247 (1860) (N. India).

Lumu Lumu, 1 ♂.

A dark form, probably racial; in addition to the different tone, there is a violaceous edging to the lines, and the long, shallow subterminal violaceous-whitish lunules of the hindwing hardly enclose visible black dots.

221. **Dalima subflavata** (Feld.)

Xandrames (?) *subflavata* Feld., *Reise Novara, Lep. Het.* t. cxxii, f. 8 (1875) (Java).

Marei Parei, 1 ♂.

Range: Malay Peninsula, Java, Sumatra and Borneo.

222. **Dalima mjöbergi** Prout.

Sar. Mus. Journ. iii. 198, 210, t. 7, f. 49 (1926) (Sarawak: Mt. Murud).

Lumu Lumu, 2 ♂ ♂.

Only the type was previously known.

223. **Amblychia angeronaria** Guen.

Spec. Gén. Lép. ix. 215, t. iv, f. 9 (1858) (Central India).

Marei Parei, 1 ♀.

Rather small, otherwise agreeing well with the forms which are prevalent in the Malayan subregion and which will probably demand a subspecific name. The only race (?) that has yet been named is *torrida* Moore (1877), from the Andamans, but Semper's indications (*Schmett. Philipp.* ii. 611) seem to point to another on the Philippines. Name-typical *angeronaria* inhabits India, Burma, Hainan and possibly Formosa. The Moluccan and Papuan forms which have been referred here are, I believe, distinct though closely related species.

224. **Amblychia infoveata** sp. n.

♂, 82 102 mm. Basal scaling of antenna generally less clear white than in *schistacea* Warr. (1905), more tinged with cream-colour.

Forewing with fovea weak, fully scaled above; termen with a more noticeable change of direction at R^1, thus slightly more oblique posteriorly; less brown than in *angeronaria*, the slaty shades definitely preponderating (the brown chiefly noticeable between the radials and between M and the fold); the costal triangle between median and postmedian with little white maculation, oftenest with none. *Hindwing* with the bay between SC^2 and R^1 relatively long posteriorly, the tail at the radials being more produced. Underside dull with the lines and bands blackish, the proximal subterminal heavy.

Borneo: Kinabalu (Waterstradt), a series in Mus. Tring, including the type; Kenokok, 3 ♂ ♂ (H. M. Pendlebury). Known to me also from Penang, W. Sumatra and

Java; has long awaited publication in a proposed revision of *Amblychia*.

225. **Xerodes ypsaria** Guen.

Spec. Gén. Lép. ix. 291 (1858); Oberth., *Et. Lép Comp.* vii,fig. 1711 (1913) (Borneo).

Lumu Lumu, 1 ♂; Kiau, 1 ♂.

The Malayan form is best known from Borneo, but reaches Java and even Bali. The Indian *testacearia* (Moore, 1867), for which Swinhoe, not knowing Guénee's *Xerodes*, erected a genus *Gyadroma*, is perhaps racially tenable, being on an average rather larger, the termen of the hindwing possibly a trifle more dentate.

226. **Elphos cavimargo** Prout.

Nov. Zool. xxxii. 54 (1925) (Kinabalu).

Kenokok, 3 ♂ ♂.

This distinctively shaped *Elphos* seems to be peculiar to Kinabalu, where it has been taken in some numbers.

227. **Ophthalmodes** sp.

Lumu Lumu, 1 ♀.

A large specimen, which I have not been able to determine. Conceivably the ♀ to a race of *herbidaria* Guen., the cell-spots less surrounded with black above, less large beneath, the borders of the underside not quite agreeing in form. The Malayan species of this genus, however, are either extraordinarily variable or—more probably—are more numerous than has yet been realized and it is unfortunate that hitherto they have generally been picked up singly or in very small numbers.

228. **Racotis inconclusa** (Walk.)

Boarmia inconclusa Walk. xxi. 382 (1860) (Silhet).

Marei Parei, 1 ♂, 9 ♀ ♀; Lumu Lumu, 1 ♂.

Commoner in the Malayan subregion than in India. Numerous races and very close allies are known from the Moluccas, New Guinea, Queensland, the Bismarcks, etc.

229. **Ectropis longiscapia** Prout.

Sar. Mus. Journ. iii. 199 (1926), iv. t. 16, f. 6 (1928) (Sarawak: Mt. Poi).

Marei Parei, 1 ♂, 1 ♀; Lumu Lumu, 1 ♂.

Since this species was described, it has been found in a few other mountains of the Malay Peninsula.

230. **Ectropis ischnadelpha** sp. n. (Pl. X, fig. 17).

♂ ♀, 35–40 mm. Face whitish, the upper part scarcely more noticeably tinged with brown than the lower. Antennal ciliation of ♂ well over length of diameter of shaft. Head, body and legs whitish, in part slightly suffused with brown. Hindtibia of ♂ not dilated.

Forewing slightly narrower than in most of the *bistortata* (Goeze, 1781) group, to which it absolutely belongs in structure and facies; stalk of $SC^{1.2}$ in all the known ♂ ♂ arising from the cell, the coincident vein $SC^{1.2}$ in the ♀ ♀ either from the cell or connate; dead white, about as in *païs* Prout (1931), the brownish irroration quite weak; markings as in the allies, but with cell-mark generally better expressed, somewhat elongate, and with the blackish postmedian dashes at R^3 and M^1 not accompanied by any correspondingly darkened ones in the band beyond; line beyond subterminal more definite than in most of the group; terminal dots and triangles strong, brown, not mixed with black. *Hindwing* also slightly narrowed; cell-mark generally as on forewing; proximal line well developed, sharply sinuous or subangled; postmedian very oblique posteriorly; proximal shade well developed, macular.

Underside weakly marked, about as in *bhurmitra sabulosa* Warr. (1897); a subterminal half-band sometimes fairly noticeable anteriorly.

Lumu Lumu, 5,500 feet, 5–15 May, 6 ♂ ♂, 6 ♀ ♀, including the type; Marei Parei, 5,000 feet, 1 ♀.

Differs from the similarly coloured *païs* of the Malay Peninsula in its larger size, non-bicoloured face, etc.

231. **Ectropis proïcyrta** sp. n.

♀, 36 mm. Head whitish, behind eye partly fuscous; palpus moderate, strongly rough-scaled beneath, fuscous on outerside, terminal joint very small, white. Thorax and abdomen pale, with slight dark admixture, abdomen above whitest at base, then with a few indistinct dark spots.

Forewing shaped nearly as in the *bistortata* group or slightly shorter; $SC^{1.2}$ rather long-stalked, arising from stalk of SC^{3-5} near its base, connected by bar with C, SC^2 later anastomosing with $SC^{3.4}$; yellowish white, with coarse and in many places copious dark red-brown irroration, freer therefrom in posterior part of median area and longitudinally about R^3–M^1, especially distally; cell-dot fairly large, black; a dark dot in front of SM^2 close to base; lines from large blackish costal dots; antemedian vertical from costa at 4.5 mm., rather strong and regularly curved to just behind fold, then weaker and apparently more irregular; a slight shade proximal to it, ill-defined except as a costal dot; median weak, outbent round the cell-dot, almost lost behind M^2 in a thick curved blackish lunulate-dentate streak which from before M^2 to hindmargin closely accompanies the postmedian proximally; postmedian from beyond ⅔ costa, anteriorly traceable only by dots and irroration and a faint yellow tinge which accompanies it, from before M^2 to hindmargin stronger, zigzag; subterminal chiefly shown by dark spots or lunules which accompany it proximally—two or three very small anteriorly, two less small at R^1 and four larger between M^1 and hindmargin; weaker dark shading distally to subterminal at the same positions; terminal dots strong. *Hindwing* shaped nearly as in the *bistortata* group; concolorous with forewing but with, in addition, the costal edge and the posterior area between postmedian and subterminal clearer whitish; antemedian line thick, regularly curved, from SC to hindmargin about 3 mm. from base, with an ill-defined dark shade proximally; cell-dot, postmedian (bicurved), subterminal and termen as on forewing.

Underside with cell-dots strong, costal dots and median shade indicated; both wings with an ill-defined subterminal dark band, broadest on forewing anteriorly, sub-interrupted about cellule 3.

Marei Parei, 5,000 feet, 1 May, 1 ♀.

Slightly worn, but unmistakeable in the strong, curved antemedian line of the hindwing, etc. Slight suggestions of *inceptaria* (Walk., 1866) medially, and of some of the *bistortata* group subterminally, are hardly significant taxonomically.

232. **Ectropis geniculata** sp. n. (Pl. X, fig. 18).

♂, 34–36 mm. Larger than *pingasoides* (Warr., 1893), with which it agrees perfectly in ♀ structure, unless the 3rd joint of the palpus is slightly longer in proportion. Wings scarcely dark-clouded, except in parts of the distal area, the white central area of the forewings with an exceptionally sinuous median line outside the cell-spot; postmedian of forewing less proximally placed than in *pingasoides*, almost straight to behind M^1, then bluntly elbowed, posteriorly less sharply inbent than in *pingasoides*; terminal area with a large additonal pale spot at R^3–M^1. Underside with corresponding distinctions.

Lumu Lumu, 5,500 feet, 7 April (type) and 8 April (paratype).

The paratype, besides being a trifle darker than the type, retains (though weakly) the basal part of SC^{1+2} of the forewing, whereas in the type—as in most *pingasoides*—it is lost, leaving SC^{1+2} to arise out of C.

233. **Ectropis simplaria** Swinh.

Tr. Ent. Soc. Lond. 1894, p. 221 (Khasia Hills).

Marei Parei, 1 ♂, 14 ♀♀; Lumu Lumu, 1 ♂, 2 ♀♀; Kamborangah, 2 ♂♂, 1 ♀.

Distributed in various races, from N. India to Formosa and to New Guinea; compare *Journ. Bomb. Nat. Hist. Soc.* xxxi. 933, *Nov. Zool.* xxxvii. 32.

234. **Ectropis idaeoides** (Moore).

Cleora idaeoides Moore, *Lep. Coll. Atk.* 239 (1888) (Darjiling).

Marei Parei, 1 ♀.

The specimen is large like the Mt. Murud ♀♀ (*Sar. Mus. Journ.* iii. 199), the hindwing sharply marked.

235. **Ectropis tristis** (Butl.)
Abaciscus tristis Butl., *Ill. Het.* vii. 102, t. 135, f. 18 (1889) (Dharmsala).
Marei Parei, 1 ♂.

The very few Malayan examples which I have seen (Borneo and Sumatra) vary considerably *inter se* and I cannot at present establish a new race or races. *E. tristis* proper is, so far as I know, exclusively North Indian.

236. **Ectropis (Ruttelerona) lithina kinabalensis** Prout.
Nov. Zool. xxxii. 60 (1925) (Kinabalu).
Kenokok, 6 ♂ ♂ ; Marei Parei, 1 ♂, 3 ♀ ♀ ; Lumu Lumu, 6 ♂ ♂, 8 ♀ ♀.

The same race has also been found on Mt. Poi, Sarawak (see *Sar. Mus. Journ.* iii. 200). Name-typical *lithina* Warr., (1903) is from New Guinea.

237. **Diplurodes vestita** Warr. (form. ?)
Nov. Zool. iii. 132 (1896) (Khasis).
Marei Parei 2 ♂ ♂ ; Lumu Lumu 1 ♂.

The Kinabalu form, as judged from these few examples, has much white admixture, but I have also seen one Bukit Kutu ♂ similarly marked and the variable Malay race (?) has not yet been quite satisfactorily cleared up.

238. **Diplurodes sugillata** sp. n. (Pl. XI, fig. 21).

♂ ♀, 30–32 mm. Head white; face dark-sprinkled; palpus largely infuscated on outerside, 3rd joint quite small, partly concealed. Antennal shaft of ♂ not broad, ciliation long (about 3). Hindtibia of ♂ not hairy (midlegs unfortunately lost, probably not hairy. Abdomen of ♂ with lateral pencils quite slight.

Forewing white, the proximal area generally, that between postmedian and subterminal always (in the known examples) heavily clouded with dark brown and violet-slate, the clouding also invading at least a part of the terminal area, a white spot always remaining in cellule 3; antemedian fine; cell-mark rather weak in the ♂, strong in the ♀ ♀ ; median excurved outside the cell-mark, posteriorly approximated to, but not fusing with, the postmedian; postmedian shaped about as in *semijubata* Prout (1929) ; subterminal fine, irregularly dentate (as in *decursaria* Walk., 1862. and *inundata* Prout, 1929) ; terminal dots well developed; fringe spotted. *Hindwing* with cell-mark strong elongate; median shade thick, hardly curved, moderately oblique; postmedian rather near cell-spot, posteriorly crenulate; distal area about as on forewing.

Underside much as in *semijubata*, but with the terminal white more restricted, particularly in posterior half of hindwing; scarcely different from that of *decursaria*, median shade of forewing posteriorly touching or closely approaching postmedian.

Lumu Lumu, 5,500 feet, 8 April, type ♂, 13 April and 5 May, 2 ♀ ♀; Marei Parei, 5,000 feet, 30 April 2 ♀ ♀.

Readily distinguished from *semijubata* by the distal area of the hindwing posteriorly, the far less tufted ♂ abdomen and simpler armature of the ♂ valve. Really nearer to *inundata*, but again with simpler ♂ abdomen, also with less broad borders beneath. Possibly a dark mountain form of *decursaria*, of which I am not yet positive that I know the true ♂, though the probable claimants differ from *sugillata* in the ♂ antenna; in any case requiring a name.

239. **Diplurodes exprimata** (Walk.) (form ?).

Acidalia exprimata Walk. xxiii. 764 (1861) (Sarawak).

Marei Parei, 1 ♀.

At first sight dissimilar, the upperside being much browner, forewing with the postmedian rather more excurved than usual; but the underside is very exact to this species, though the white terminal spot of the forewing is not large. In the absence of the ♂, however, the record must be accepted with some caution.

I regard Warren's *Ectropidia*, erected for this species, as a specialized section of *Diplurodes*, with tufted middle or hindlegs in the ♂. Typical *exprimata* belongs to Borneo and the Malay Peninsula, but forms which seem only to differ sub-specifically are known from the Moluccas and New Guinea.

240. **Gasterocome pannosaria macarista** subsp. n.

Forewing with median area less dark-speckled than in *p. pannosaria* (Moore, 1867), from N. India; subterminal spots whiter in posterior part; pale terminal patch between R³ and M¹ better developed, especially beneath. *Hindwing* both above and beneath less irrorated than in *p. pannosaria*; subterminal line posteriorly well developed in the dark marginal band.

Lumu Lumu, 5,500 feet, April and May, type ♂ and 3 ♀ ♀; Kiau, 3,000 feet, 2 May 1929, 1 ♂.

Races of this species are also known from W. China (*sinicaria* Leech, 1897, as *Boarmia*), Formosa (*orta* Bastelb., 1911, as *Boarmia* apparently identical with the preceding), Java (*contacta* Warr., 1899, as *Diplurodes*), Sumatra and the Malay Peninsula (not yet separated from *contacta*). "*Boarmia*" *fidoniaria* Snell. (1881), from Celebes, seems to be a distinct species, though very closely related, and has perhaps a race on Ceram.

241. **Necyopa picta** (Warr.) (?)

Myrioblephara picta Warr., *Nov. Zool.* iii. 404 (1896) (S. Java).

Lumu Lumu, 1 ♀.

As I determined and returned this specimen before I had seen the remarkable material detailed below, it is probable that I may have misjudged its status. I noted that it was "heavily marked and might conceivably the ♀ to *triangularis*" (Warr., 1896, as *Polylophodes*). Little is yet known of true *picta*, but 2 ♂♂ of a *Necyopa* from E. Pegu fit the Javan ♀♀ so well that I assume them to represent a race of it. If so, the ♂ hindwing has a rounded tornus and it is very different from *triangularis*.

242. **Necyopa subtriangula** sp. n. (Pl. XI, fig. 16).

♂, 34 mm. Near *triangularis* (Warr., 1896). Antennal pectinations not quite so long and not continued so far down the shaft (at least 38 joints in *triangularis*, 32–35 in *subtriangula*, the gradualness with which they give place to mere teeth rendering the counting indefinite). *Forewing* rather narrower; coloration more varied, the dark markings being darker; rather noteworthy black admixture on and just outside the postmedian about R^2—M^1. *Hindwing* rather less strongly produced to tornus; the dark outer band rather strong, especially between radial and submedian folds.

Both wings beneath (except in one worn example) with strong dark subterminal band, on the forewing complete and with a dark projection to termen between the radials, on the hindwing ceasing rather abruptly after crossing M^1, giving place to the specialized area which is here (but not anteriorly) developed as in *triangularis*.
Lumu Lumu, 5,500 feet, 6 and 7 April, 3 ♂♂, including the type; Kiau, 3,000 feet, 2 May, 1 ♂.

243. **Necyopa ioge** sp. n. (Pl. XI, fig. 23).

♂, 27–30 mm. Extremely similar to the preceding except in shape; lateral pencils of abdomen equally well developed. Smaller, the forewing more rounded, the hindwing almost regular, without the produced tornal area and its specialized scaling and tufting; band between postmedian and subterminal much less developed, though the postmedian itself retains some rather sharp blackening in the middle; first outward projection of postmedian of forewing rather stronger (more as in *triangularis*); three black markings outstandingly conspicuous, namely a subterminal spot at R^2 of forewing, the oblique dash at abdominal margin of hindwing (common to the group) and the broader mark near its tornus. Underside much as in *triangularis*, but with the lines of hindwing almost reaching abdominal margin.

Lumu Lumu, 5,500 feet, 7–16 April, 8 ♂♂, including the type; Marei Parei, 5,000 feet, 27 and 29 April, 2 ♂♂.

A ♀ from Lumu Lumu, 8 April, expanding 31 mm. and shaped as in the ♂♂, may belong here, as suggested by the form of the postmedian line, or—perhaps more probably—to *subtriangula*, as suggested by the strong outer shades and enlarged subterminal spot between the radials. See also *N. picta* (?) above.

244. **Necyopa refrenata** sp. n. (Pl. XI, fig. 15).

♂, 32–33 mm. Lateral tufts of abdomen less developed than in the two preceding, the first one short, more fan-like than penicillate. Wings shaped nearly as in *ioge*, or slightly more elongate; tone a little more olivaceous than in either of the preceding, more as in *triangularis*. *Forewing* with the markings blurred, the median area less clear, therefore less differentiated, than in the two preceding; the shades which bound it about as broad as in the most heavily marked *ioge;* postmedian with outward bend at least as weak as in *subtriangula*, scarcely any black accentuation excepting a spot at base of R^3 and M^1; spots outside subterminal weak, at the radials double. *Hindwing* distinguishable from that of *ioge* by the weaker oblique dash at abdominal margin and by the different orientation of the dark tornal mark. Underside similar to that of *ioge* but with less sharp contrasts, a double subterminal shade on both wings nearly as well developed as the double postmedian.

Lumu Lumu, 5,500 feet, 8 April, type ♂; Kamborangah, 7,200 feet, 30 and 31 March, 2 worn ♂♂, apparently with the markings of the forewing more as in the two preceding species.

245. **Cleora neomenia** sp. n. (Pl. IX, fig. 8).

♂, 40–47 mm.; ♀, 44–50 mm. Very closely related to *mjöbergi* Prout (1926). On an average rather smaller. Forewing, at least in the ♂, relatively somewhat narrower, hindwing with termen appreciably more crenulate. Both wings with the pale cell-mark reduced, forming a narrow lunule; postmedian line noticeably more crenulate, on the forewing appreciably incurved between costa and R^1, excurved (sometimes quite markedly) at the radials.

Structure nearly as in *mjöbergi*; ♂ genitalia with the valve broader, the scobinate tract considerably shorter, an additional spine present, arising near the middle of the curved prong (cf. *Bull. Hill Mus.* iii. 187, t. v, f. 3).

Lumu Lumu, 5,500 feet, April and May, 57 ♂♂, 6 ♀♀, including the type; Marei Parei, 5,000 feet, 3 ♂♂, 1 ♀

Variable, like nearly all the group. The coloration is on the whole browner than in *mjöbergi* and the basal area of the hindwing very rarely so conspicuously whitened, often, indeed, almost concolorous with median area. The principal aberrations are one with the median shade thickened and blackened (noticed also in *mjöbergi*) and one with the entire median area (on the hindwing almost to the base) heavily darkened.

246. Cleora alienaria gelidaria (Walk.)

Boarmia gelidaria Walk. xxvi. 1537 (1862) (Canara).

Cleora alienaria gelidaria Prout, *Bull. Hill Mus.* iii. 191 (S. India and Ceylon; ? Malay Peninsula, Java, Borneo, Sambawa, Pura, Timor).

Kiau, 1 ♂.

247. Cleora pendleburyi Prout.

Nov. Zool. xxxv. 70 (1929) (Selangor).

Marei Parei, 2 ♂♂ 2 ♀♀.

Known also from S. W. Sumatra and Sarawak.

248. Cleora determinata (Walk.)

Boarmia determinata Walk. xxi. 384 (1860) (Sarawak).

Lumu Lumu, 1 ♂.

Distribution about as in the preceding.

249. Cleora injectaria (Walk.) (?).

Boarmia injectaria Walk. xxi. 376 (1860) (Ceylon).

Lumu Lumu, 1 ♀, a large form provisionally referred to this very widely distributed species. See *Bull. Hill Mus.* iii. 210 *seq.*

250. Cleora (Carecomotis) propulsaria (Walk.)

Boarmia propulsaria Walk. xxi. 385 (1860) (Sarawak).

Kenokok, 1 ♂; Marei Parei, 1 ♂.

A common species in the Indo-Malayan subregion. It is still a little doubtful whether the Queensland and New Guinea forms, which are generally known as "*pupillata* Walk." are strictly conspecific, though they are certainly very closely related; Walker's type of "*Boarmia pupillata*" (1860), in the Oxford Museum, is, however, from Sarawak and will therefore probably prove to be the ♀ to true *propulsaria*.

251. Cleora versicolor Prout (?).

Boarmia (Cleora) versicolor Prout, *Sar. Mus Journ.* ii. 181 (1915) (Kinabalu).

Pakka, 10,200 feet, 25 March, 1 ♂.

A fine dark specimen, expanding 47 mm., the forewing so uniformly suffused with blackish brown (somewhat testaceous-mixed) as almost to obliterate the markings, excepting the rather large black cell-spot and thick costal beginnings of the lines. It agrees in venation with, and is most probably a dark aberration of, my *versicolor*, which was founded on 2 ♀♀ from the same high altitude and of which the type measures 54 mm. ("42" is a misprint for "52," a slight underestimate). I cannot, however, feel quite sure of the identity and deplore that no further examples rewarded Mr. Pendlebury's labours.

252. Cleora derivata Prout.

Sar. Mus. Journ. iii. 203 (1926), t. 16, f. 9 (1928) (Sarawak: Mt. Murud).

Kamborangah, 6 ♂♂, 4 ♀♀.

253. Cleora aeglophanes Prout.

Sar. Mus. Journ. iii. 203 (1926), t. 16, f. 9 (1928) (Sarawak: Mt. Murud).

Kiau, 1 ♂, 1 ♀; Marei Parei, 6 ♂♂; Lumu Lumu, 20 ♂♂, 8 ♀♀; Kamborangah, 1 ♂.

In erecting this species I mentioned one known ♂ from Kinabalu; the present collection shows that it is well distributed on the mountain.

254. Cleora praevariegata Prout.

Sar. Mus. Journ. iii. 202 (1926), t. 16, f. 8 (1928) (Sarawak).

Lumu Lumu, 2 ♀♀.

The ♀ allotype was darker than these specimens, one of which makes a good match in coloration to the ♂ holotype.

255. Cleora expleta sp. n. (Pl. XI, fig. 25).

♂ ♀, 25–32 mm. Head whitish, more or less suffused (or on the face mottled) with light brown. Palpus 1½–1¾, second joint heavily scaled, 3rd distinct, clavate, rather longer in ♂ than in ♀; whitish, the first and second joints partly infuscated on outerside. Antenna of ♂ pectinate to nearly ⅔ (about 27 joints), the branches long but not lax, one pair to each joint. Hindtibia of ♂ with the hair-pencil strong, brown, the tarsus scarcely over ½. Abdomen of ♂ beneath not hairy.

Forewing in ♂ with fovea moderately strong, retinaculum rather long, SC^{1-2} shortly stalked, SC^{1} anastomosing with C: in ♀ with SC^{1-2} rather longer stalked, their stalk anastomosing slightly with C; very variable, whitish or more buff, in the ♂♂ densely, in the ♀♀ much more sparsely, irrorated with blackish, in both sexes nearly always with ill-defined ochraceous-tawny bands proximally to the antemedian and distally to the postmedian (in one fine ♀—ab. with these bands overlaid with blackish): cell-spot blackish, slightly elongate; antemedian excurved in cell; median beyond cell-spot, slightly oblique outward to an angle in cellule 5, thence approximated to postmedian, weak or obsolescent; postmedian from costa at ⅔ or less, excurved at radials and very weakly just behind M^{2}; subterminal dentate, inbent at R^{1}, accompanied, especially proximally, by some blackish shading, the proximal often connected with the postmedian about R^{3}; a white admarginal spot in cellule 3; fringe irregularly chequered. *Hindwing* more ochreous-tinted, costally pale; median line sinuous, from close to cell-dot, at abdominal margin very oblique; subterminal indicated, with some dark shading proximally.

Hind- and in part forewing beneath warm buff, the forewing proximally more or less suffused with greyish, the costal edge spotted; cell-spots larger than above; median and postmedian lines more or less developed, the latter on hindwing generally punctiform; variable subterminal shades developed, broader on forewing, here generally in part more or less connected with termen, bringing into bold relief the pale spot of cellule 3.

Kamborangah, 7,200 feet, 1–3 April, 3 ♂ ♂ (including the type), 30 March, 1 ♀; Lumu Lumu, 5,500 feet, 12–14 April, 1 ♂, 3 ♀ ♀; Marei Parei, 5,000 feet, 15 ♂ ♂, 4 ♀ ♀.

256. **Alcis (?) nigrifasciata** (Warr.)

Parasynegia nigrifasciata Warr., *Nov. Zool.* iii. 393 (1896) S. Java).

Lumu Lumu, 1 ♂.

A very interesting find, the type ♂ of this conspicuous species having until now remained unique. Its relationship is apparently with *A. prygeraria* (Leech, *Ann. Mag. Nat. Hist.* (6) xix. 120) and I cannot understand Warren's referring it to *Parasynegia*. Face moderately appressed-scaled, palpus shortish, rather stout, hindtibia with pencil, thorax tufted posteriorly, forewing with fovea. Except that —at least typically—the base of SC^1 is obsolete, leaving that vein to arise out of C ("*Medasina*" by Hampson's key) I find nothing to keep it out of the *Cleora-Alcis* group.

257. **Boarmia dentigerata** (Warr.)

Dienotrichia dentigerata Warr., *Nov. Zool.* vi. 53 (1899) (Penang).

Marei Parei, 1 ♂.

Previously known only from Penang and Selangor.

258. **Boarmia (Calicha) minima praeoptata** subsp. n.

♀, 30–36 mm. Larger than *m. minima* Warr. (1896, Khasis); hindwing above with the posterior brown patch larger, reaching or almost reaching R^3; forewing beneath with postmedian line expanded into a triangle at costa, here (and slightly further hindward) accompanied distally by an ill-defined pale, buff-tinged patch.

Lumu Lumu, 5,500 feet, April, type ♀ and another; Marei Parei, 5,000 feet, 3 ♀ ♀.

Unfortunately I know only ♂ ♂ of the name-typical race, but it is safe to assume that the differences are subspecific (if not specific) rather than sexual.

259. **Serraca spissata** Warr.

Nov. Zool. vi. 56 (1899) (Nias).

Kabayau, near Kinabalu, 2 ♂ ♂.

The type locality (probably with Siberut, see *Nov. Zool.* xxxvii. 17) and Borneo represent the limits of the range of this species, west and east.

260. **Prochasma dentilinea** (Warr.)

Psilalcis dentilinea Warr., *Proc. Zool. Soc. Lond.* 1893, p. 431 (Sikkim; Nagas).

Marei Parei, 8 ♂ ♂, 1 ♀; Lumu Lumu, 36 ♂ ♂, 3 ♀ ♀.

There seems to be a racial tendency in the reduction of the dark markings of the border of the hindwing, at least in the ♂♂; but it is inconstant both here and in Sikkim.

The species is also known from the Malay Peninsula and Formosa. I have already (*Sar. Mus. Journ.* iii. 207) recorded it from Sarawak.

261. **Prochasma scissivestis** Prout.

Sar. Mus. Journ. iii. 208 (1926), t. 16, f. 12 (1928) (Sarawak: Mt. Murud).

Lumu Lumu, 3 ♀♀.

262. **Dasyboarmia isorrhopa** sp. n. (Pl. IX, fig. 4).

♂ 42–48 mm. Structural characters as given for the genus (*Bull. Hill. Mus.* ii. 155) with the following exceptions: eye not hairy; vertex with a loose crest; antenna with about 18 joints serrate to nearly simple; midtibia not hairy; hindtibia, at least sometimes, with small groove and slender hair-pencil; forewing beneath more hairy in cell; wing-tegula ending in a broad, suberect tuft (nearly as well developed in the genotype, though not noticed in the description).

Head and body mostly concolorous with wings; outerside of palpus, much of breast and end of tegula more blackish-fuscous. *Forewing* relatively shorter and broader than in *hyperdasys* Prout (1928); coloration and markings about as in the described form of that species, apparently hardly variable; a rather conspicuously clear apical patch about as in *Hemerophila delineata* Walk. *Hindwing* very ample; termen rather more deeply crenate than in *hyperdasys*; markings similar. Underside considerably darker than in *hyperdasys*, especially as far as the postmedian line, the forewing becoming whitish at hindmargin; forewing with some pale costal spots; both wings with blackish cell-spot and postmedian line.

Lumu Lumu, 5,500 feet, April 1929, 16 ♂♂; 1 ♀; including the type; Kamborangah, 7,200 feet, 1 ♂, 1 ♀; Marei Parei, 5,000 feet, 30 April and 1 May, 4 ♂♂, 1 ♀.

This species establishes very definitely the relationship between the most hairy *Hemerophila* and *Dasyboarmia*. I cannot see a sign of hair on the eye in any example, but otherwise it is so near to *hyperdasys* that it must obviously go into the same genus.

263. **Hemerophila delineata** (Walk.)

Boarmia delineata Walk. xxi. 387 (1860) (Sarawak).

Marei Parei, 1 ♀.

Perhaps restricted to Borneo; see *Sar. Mus. Journ.* iii. 207.

264. **Medasina strixaria** (Guen.)

Hemerophila strixaria Guen., *Spec. Gén. Lép.* ix. 217 (1858) (East Indies).

Marei Parei, 1 ♂; Lumu Lumu, 1 ♂.

Range: Ceylon to Tonkin and Borneo. I have recently (1928) described a race from Celebes.

265. **Medasina embolima** Prout.

Bull. Hill Mus. ii. 157 (1928) (Sumatra).

Lumu Lumu, 1 ♂.

New for Borneo.

266. **Medasina vinacea** Prout.

Sar. Mus. Journ. iii. 208 (1926), t. 16, f. 10 (1928) (Sarawak: Mt. Murud).

Marei Parei, 2 ♂♂; Lumu Lumu, 5 ♂♂, 1 ♀.

267. **Arctoscelia epelys** sp. n. (Pl. X, fig. 2).

♂, 42 mm. Thorax and abdomen concolorous with wings; head, with palpus, darker. Hindtibia with dense pale pencil; abdominal spine strong.

Wings less elongate than in typical *Arctoscelia* Warr. (*Nov. Zool.* iv. 102). *Forewing* with a well-developed fovea beneath, bounded distally by a tuft of long distad-directed scales; SC^2 stalked beyond SC^5 (doubtless by obsolescence of the part which would lie proximally to an anastomosis with SC^{3-4}); the pale ground-colour almost entirely obscured by a blend of brownish-vinaceous and olivaceous-black scaling, the latter inclined to form close transverse strigulae, the former rather prominent along the veins; cell-spot with some pale scales in its centre; costal edge with some pale dots; antemedian line twice excurved and inangled, the points touched with white dots; postmedian pale-edged distally, lunulate-dentate, with a much larger tooth at R^1; four black spots immediately beyond the postmedian; terminal dots subtriangular; fringe chequered. *Hindwing* paler and with the vinaceous scaling almost confined to the veins of distal area and the fringe; cell-spot less sharp than on forewing; postmedian more regular; dark-spots beyond it slight, only the last fairly large; terminal marks slighter, more lunular; dark fringe-spots strong opposite most of the veins.

Forewing beneath with the colouring similar, the blackish shade more blurred and suffusing most of the wing as far as the postmedian; cell-spot discernible in an ill-defined paler area. Hindwing beneath coloured as forewing; cell-spot as large and rather sharper.

Kamborangah, 7,200 feet, 2 April (type) and 1 April (paratype).

A strikingly distinct species, reminiscent of some South American *Geometrinae*, particularly *Cidariophanes* (e.g. *bistonaria* Snell., 1874), though less long-winged. Provisionally referred to *Arctoscelia*, notwithstanding the presence of a fovea, the well-marked hindwing, etc.; the venational difference is probably less important than it looks on the surface.

268. **Arichanna maculata negans** subsp. n.

On an average smaller than *m. maculata* Moore (1867, Bengal), but differing chiefly in that the postmedian line of the hindwing is very incomplete, more or less dissolved into vein-dots in its posterior part, both above and beneath, and generally entirely obsolete in its anterior.

Lumu Lumu, 5,500 feet, 7–16 April, 4 ♂ ♂, including the type; Kamborangah, 7,200 feet, March and April, 2 ♂ ♂; Marei Parei, 5,000 feet, 1 ♂.

269. **Abraxas invasata** Warr.

Nov. Zool. iv. 87 (1897) (Kinabalu).

Koung, 1; Kiau, 22; Tenompok to Kiau, 1; Kenokok, 1; Marei Parei, 4; Lumu Lumu, 2.

Very variable and may embrace two or three species. A number which were shown me in papers were not very critically examined, as I assumed them all to be conspecific. There seem, however, to be various intergrades between name-typical *invasata* and *intervacuata* Warr. (*Nov. Zool.* iii. 396, as *Potera*, Mt. Mulu), and if these really represent different species some careful work will be needed for their delimitation; while if they are all one, the name given to the Kinabalu *Abraxas* will have to give way to that founded on the Mulu one, which has a year's priority.

270. **Dilophodes xanthura baria** subsp. n. (Pl. IX, fig. 2).

♂ ♀. Different from *x. xanthura* Prout (*Bull. Hill. Mus.* ii. 160, Sumatra) in the much heavier black markings; particular attention may be called to the strong confluence of the three outermost series of spots on the forewing between R¹ and R of the hindwing, also the enlarged costal spots of the hindwing beneath. ♀ with the yellow anal tuft less bright.

Marei Parei, 5,000 feet, 30 April—1 May, 8 ♂ ♂, including the type; Lumu Lumu, 5,500 feet, 13 April, 1 ♂, 1 ♀.

271. **Arycanda georgiata** (Guen.)

Panaethia georgiata Guen., *Spec. Gén. Lép.* x. 196 (1858) (Borneo).

Kiau to Tenompok Pass, 1 ♀; Lumu Lumu, 2 ♂ ♂, 1 ♀.

Known also from Malacca and recorded by Snellen (*Iris* viii. 150) for Sumatra. *A. discata* Warr. (*Nov. Zool.* iv. 83), from the Natuna Islands, may well be an aberration or race of it.

272. **Arycanda arycandata** (Walk.)

Panaethia arycandata Walk. xxiv. 1108 (1862) (Borneo).

Kabayau, near Kinabalu, 1 ♂.

I know of no localities outside Borneo.

273. **Milionia fulgida reducta** Gaede.

Int. Ent. Zeit. vii. 353 (1914) (Kinabalu).

Lumu Lumu, 5 ♂ ♂.

Gaede founded this race rather badly, as "*fulgida* ab. *reducta*," describing a single specimen of a rather extreme aberration and giving no clue as to whether he knew any others from Kinabalu. If he did, presumably he mixed them with the West Javan name-type *f. fulgida* Voll. (1863) or the East Javan form *cuspidata* Bastelb. (1911). The Kinabalu form, however, clearly does represent a race apart, of a large size and narrow-banded (the name referring to the latter character) and as Gaede gave the locality his name must be accepted.

274. **Milionia pendleburyi** sp. n. (Pl. IX, fig. 1).

♀, 60 mm. Eye hairy. Head, body and legs blackish, shot—most strongly on face and front of thorax—with metallic green.

Forewing with termen posteriorly a little less oblique than in *glaucans* (Stoll, 1782); black, with some metallic blue scaling at base, along M to just beyond origin of M^2 and along SM^2 for a rather longer distance; outer band orange (colour of that of *glaucans*), curving to tornus and colouring the fringe behind SM^2.—*Hindwing* with more extended blue posteriorly, chiefly along the veins; the band incomplete, running from R^1.

Underside almost the same, the band a little paler, at least on hindwing.

Marei Parei, 5,000 feet, 30 April, 1 ♀.

Apparently near *coalescens* Semper (1901) but broader-winged, the band narrower and rather more distally placed, on hindwing rather shorter.

Explanation of Plates.

Plate IX.

Fig. 1. *Milionia pendleburyi* ♀ p. 110.
2. *Dilophodes xanthura baria* ♀ p. 109.
3. *Eurychoria perata trajecta* ♂ p. 94.
4. *Dasyboarmia isorrhopa* ♂ p. 107.
5. *Fascellina albicordis* ♂ p. 94.
6. *Heterostegania balia* ♂ p. 83.
7. *Platycerota percrinita* ♂ p. 79.
8. *Cleora neomenia* ♂ p. 103.
9. *Dindica alaopis* ♂ p. 45.
10. *Petelia delostigma* ♀ p. 93.
11. *Ecliptopera zaës* ♂ p. 58.
12. *Hypochrosis heroïs* ♂ p. 84.

Plate X.

Fig. 1. *Horisme intrepida* ♂ p. 61.
2. *Arctoscelia epelys* ♂ p. 108.
3. *Paracomucha moroëssa* ♂ p. 58.
4. *Steirophora stigmatephora* ♂ p. 73.
5. *Phthonoloba titanis incipiens* ♂ p. 72.
6. *Scardamia iographa* ♀ p. 80.

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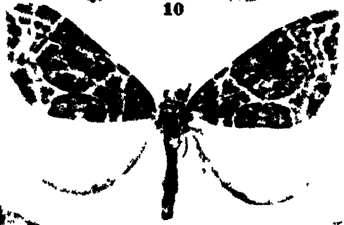
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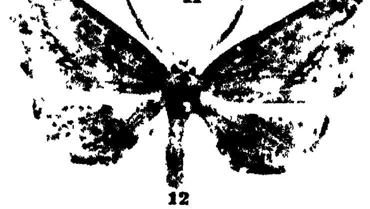
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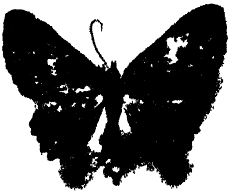
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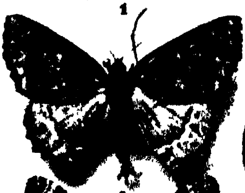
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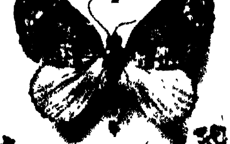
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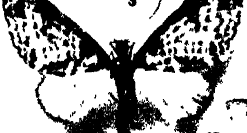
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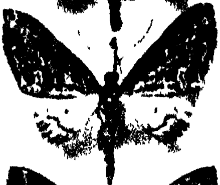
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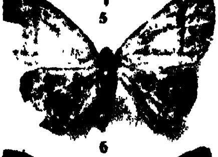
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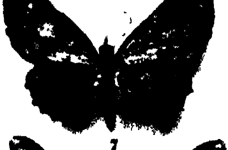
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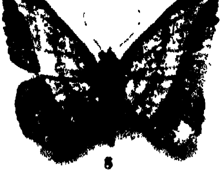
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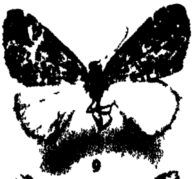
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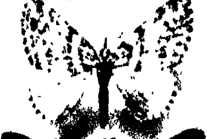
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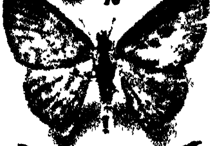
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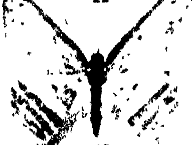
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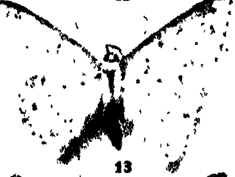
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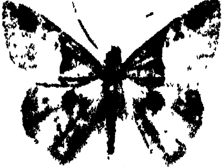
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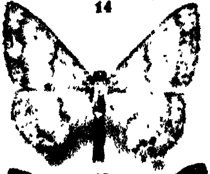
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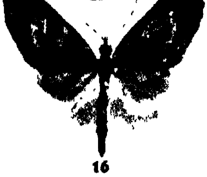
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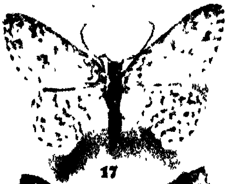
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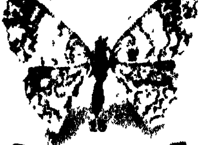
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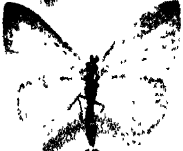
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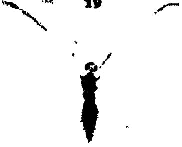
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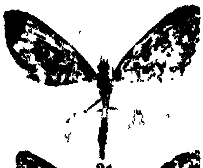
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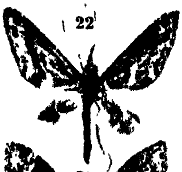
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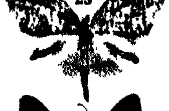
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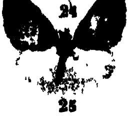
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PLATE XI.

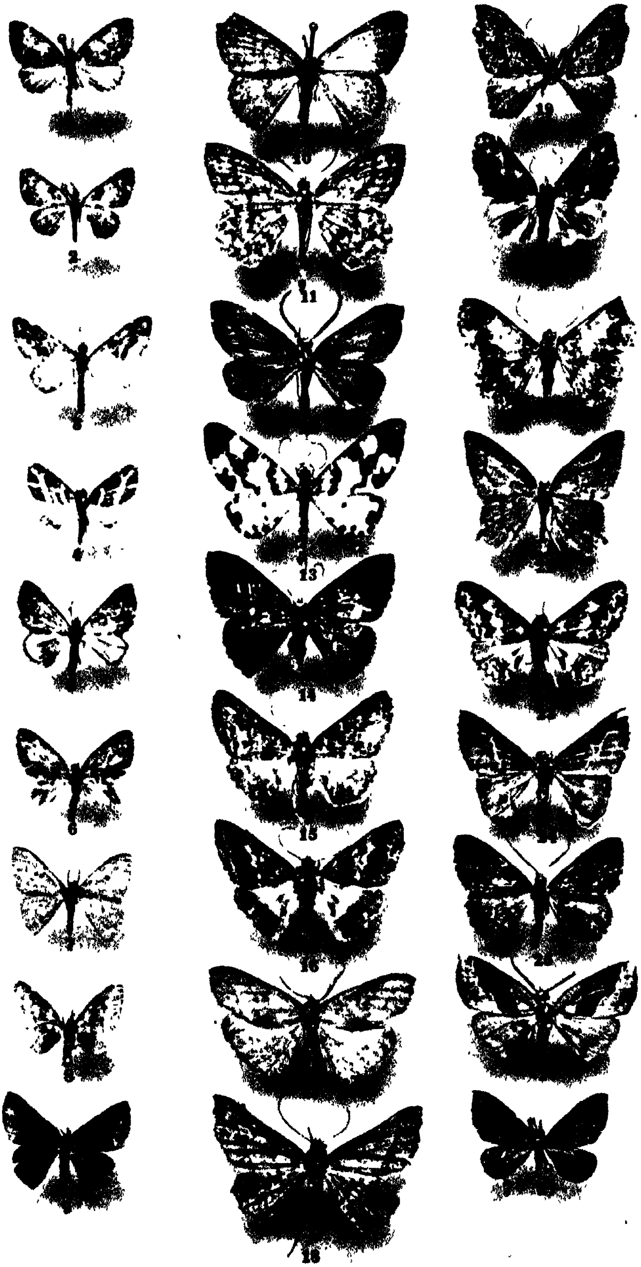


Fig. 7. *Collix mesopora* ♂ p. 60.
8. *Semiothisa hygies* ♂ p. 90.
9. *Dysstroma pendleburyi* ♂ p. 59.
10. *Horisme labeculata* ♀ p. 62.
11. *Anisodes hirtipalpis* ♂ p. 52.
12. *Luxiaria subgravata* ♂ p. 89.
13. *Luxiaria tephrosaria ichnaea* ♂ p. 88.
14. *Petelia paroobathra* ♂ p. 93.
15. *Xenostega sobrina* ♂ p. 81.
16. *Phthonoloba bostryx* ♂ p. 72.
17. *Ectropis ischnadelpha* ♂ p. 97.
18. *Ectropis geniculata* ♀ p. 99.
19. *Poecilasthena nubivaga* ♂ p. 56.
20. *Poecilasthena character* ♂ p. 57.
21. *Steirophora bathylima* ♂ p. 73.
22. *Sauris quassa* ♂ p. 77.
23. *Sauris* (*Tympanota*) *gyiarces* ♂ p. 75.
24. *Sauris usta poeciloteucta* ♂ p. 76.
25. *Micromia* (*Prosthetopteryx*) *chlaenistes* ♂ p. 63.

Plate XI.

Fig. 1. *Chloroclystis* (*Rhinoprora*) *coelica* ♂ p. 66.
2. *Chloroclystis telygeta* ♀ p. 65.
3. *Gymnoscelis merochyta* ♂ p. 69.
4. *Chloroclystis* (*Rhinoprora*) *eurystalides* ♂ p. 67.
5. *Chloroclystis celaenacris* ♂ p. 64.
6. *Micromia* (*Tripteridia*) *subcomosa animata* ♂ p. 63.
7. *Argyrocosma phrixopa strepens* ♂ p. 46.
8. *Chloroclystis* (*Gymnopera*) *rubroviridis nubifera* ♂ p. 65.
9. *Chrysocraspeda dysmothauma* ♀ p. 51.
10. *Anisodes dimerites* ♂ p. 54.
11. *Synegia asymbates* ♂ p. 82.
12. *Sabaria rigorata* ♂ p. 86.
13. *Ozola pantomima* ♂ p. 43.
14. *Organopoda cnecosticta* ♂ p. 50.
15. *Necyopa refrenata* ♂ p. 103.
16. *Necyopa subtriangula* ♂ p. 102.
17. *Anisodes posticamplum expunctor* ♂ p. 53.
18. *Callerinnys statheuta* ♂ p. 87.
19. *Goniopteroloba solivaga* ♂ p. 70.
20. *Micromia* (*Prosthetopteryx*) *latistriga cophogona* ♂ p. 63.
21. *Diplurodes sugillata* ♂ p. 100.
22. *Diplodesma stictogramma* ♂ p. 49.
23. *Necyopa ioge* ♂ p. 102.
24. *Hypulia strictiva* ♂ p. 87.
25. *Cleora expleta* ♂ p. 105.
26. *Hypochrosis callopistes* ♂ p. 85.
27. *Propithex glaucisparsa* ♂ p. 59.

III. MEMBRACIDAE FROM MT. KINABALU

By W. D. FUNKHOUSER.

University of Kentucky.

(With seven text figures).

Through the courtesy of Mr. H. M. Pendlebury, Systematic Entomologist of the Federated Malay States Museums at Kuala Lumpur, the writer has been permitted to study a small collection of Membracidae taken on Mt. Kinabalu in British North Borneo in 1929. Twenty species are represented in this collection of which seven are apparently new and are here described and figured.

Most of the specimens were collected rather low down on the mountain, the altitude records, as indicated on the specimen labels, ranging from 3,000 to 5,500 feet. Mr. Pendlebury states that the forest is almost continuously sodden above the 4,000 foot level to the tree limit which is roughly 10,500 to 11,500 feet and that above this elevation a bare granite core which rises to an elevation of 13,455 feet supports but little vegetable life.

It is rather remarkable that of the seven new species described in this paper, three of them should belong to the rare genus *Pyrgauchenia* Breddin, and even more remarkable that of the nine species previously described in this genus, four of them should be from Borneo and three of these are from Mt. Kinabalu. It would certainly seem either that this one mountain is unusually rich in species of this peculiar genus or that the forms represented show so much variation as to mislead the systematist regarding the number of distinct species. The three here described are apparently entirely distinct from any previously named, and for each there is a good series of specimens showing practically no variation within the series.

Another fact which at once attracts attention is that of two of the species here described, one is represented by a series of twenty-seven males only and the other by a series of ten females only, all thirty-seven specimens collected at the same locality on the same dates, as evidenced by the specimen labels. This of course at once suggests that the two series represent the two sexes of the same species, yet in general appearance and contour they are so entirely dissimilar that such a conclusion seems hardly tenable. None of the insects were taken *in cop* and we have no data on their life-histories. If it should prove that our *brunnea* and *angulata* are the same species, and it should develop that there is great difference between the sexes, then we should at once be suspicious that other previously described species in the genus, described from a single sex, may prove to be different sexes of the same form, or that the two species here described as new from a single sex may be synonyms of some species previously described from the opposite sex.

Since we have no breeding work or field observations to guide us in the matter, we are here describing the two forms as distinct and await further information or more material to justify or disprove our conclusions.

1. **Pyrgauchenia brunnea** sp. n. (Fig. 1).

Brown with large yellow patch at base of posterior process; finely punctate, not pubescent; pronotal process long, slender, apical half bent backwards, tip bilobed and foliaceous with a heart-shaped opening between the lobes; posterior process slender, slightly elevated at middle, tip just reaching internal angle of tegmina; tegmina opaque, brown, coriaceous, veins obliterated except on apical third.

Head longer than wide, brown, finely punctate, lightly pubescent; base deeply sinuate with a small nodule on each side; eyes large, brown, prominent; ocelli large, brown, elevated, three times as far from each other as from the eyes and situated about on a line drawn through centers of eyes; genae flattened, angular; clypeus foliaceous, extending for three times its length below inferior margins of genae, tip rounded.

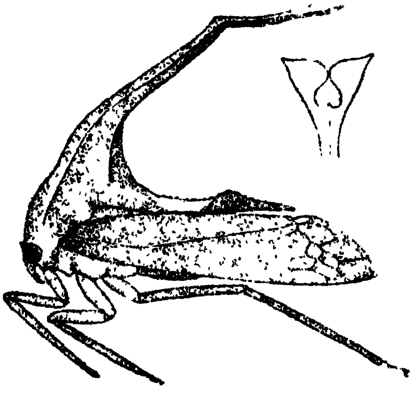


Fig. 1. *Pyrgauchenia brunnea* sp. n.

Pronotum brown, finely punctate; humeral angles prominent, blunt; median carina percurrent; lateral carinae continuous and yellowish from eyes to tips of lobes of pronotal process; pronotal process long, slender, curving backwards, apical half bent sharply backward and ending in a bilobed, foliaceous, triangular tip with a heart-shaped opening between the lobes; scutellum exposed, brown; posterior process slender, weakly serrate above, a broad yellow band at base, a rounded elevation at middle, tip sharp and just reaching internal angles of tegmina.

Tegmina long, narrow, brown, coriaceous, opaque, punctate on basal two-thirds; veins obliterated except on apical third; three apical areas; translucent spot at apical angle; apical limbus broad.

Undersurface light brown and finely pubescent; inferior lateral margin of thorax toothed; legs uniformly light brown; tarsal joints margined with darker.

Length from front of head to tips of tegmina 6.5 mm.

Width between humeral angles 1.8 mm.

Distance from base of head to tip of pronotal process 7.5 mm.

Type: male.

Type locality: Mt. Kinabalu, B. N. Borneo. Kiau, 3,000 ft.

Described from twenty-seven males. This may be the male of the following species.

Type and twenty-four paratypes in F.M.S. Museum collection; two paratypes in author's collection.

2. **Pyrgauchenia angulata** sp. n. (Fig. 2).

Uniform stramineous, finely punctate, not pubescent; pronotal process slender, curved sharply backward from above the head and then bent acutely downwards, the tip almost touching the dorsum; posterior process slender, a high, erect lobe in the middle, tip just reaching interior angles of tegmina; tegmina subopaque, punctate, with a hyaline spot on costal margin of apical third.

Head twice as long as wide, finely punctate, not pubescent, roughly sculptured; base sinuate with a slight node on each side; eyes large, brown; ocelli large; yellow, elevated, three times as far from each other as from the eyes and situated about on a line drawn through centers of eyes; genae flattened and sinuate; clypeus twice as long as wide, extending for two-thirds its length below inferior margins of genae, tip rounded.

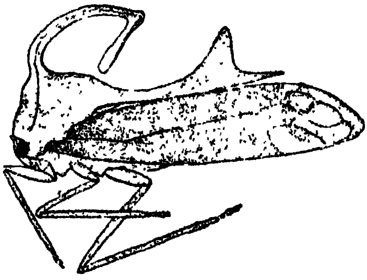


Fig. 2. *Pyrgauchenia angulata* sp. n.

Pronotum uniformly stramineous, finely punctate, not pubescent; humeral angles blunt, prominent; median carina percurrent; lateral carinae extending from above the eyes to tip of posterior process; pronotal process slender, arising from above the head, then bent sharply backwards, then suddenly downward at an acute angle, the tip almost reaching the dorsum, tip simple, rounded; scutellum weakly exposed; posterior process slender, base yellowish, a high triangular elevation in middle, tip acuminate and just reaching internal angles of tegmina.

Tegmina stramineous, darker at base, subopaque, punctured; veins obliterated except on apical fifth; four apical cells; apical limbus well defined; an arcuate hyaline spot on costal margin on apical third.

Legs and undersurface of body pale stramineous.

Length from front of head to tips of tegmina 6.5 mm.

Width between humeral angles 1.8 mm.

Type: female.

Type locality: Mt. Kinabalu, B. N. Borneo. Kiau, 3,000 ft.

Described from ten specimens, all females. Type and eight paratypes in F.M.S. collection. One paratype in author's collection.

This may be the female of the preceding species.

3. **Pyrgauchenia brevinota** sp. n. (Fig. 3).

Brown with yellow markings, coarsely punctate, not pubescent; pronotal process short, curved, with a short posterior projection at tip; posterior process just reaching internal angles of tegmina, median lobe high and arcuate, tip acuminate; tegmina coriaceous, opaque, mottled brown and yellow.

Head twice as long as wide, brown, punctate, roughly sculptured; base sinuate with a nodule on each side median line; eyes large, brown; ocelli small, brown, inconspicuous, three times as far from each other as from the eyes and situated above a line drawn through centers of eyes; inferior margins of genae sinuate, foliaceous; clypeus three times as long as wide, continuing the lines of the lateral margins of the genae, tip rounded, foliaceous.

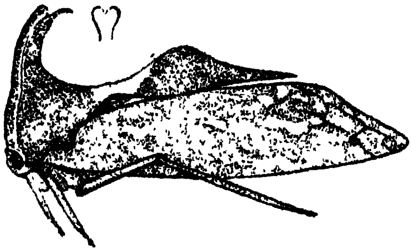


Fig. 3. *Pyrgauchenia brevinota* sp. n.

Pronotum brown, roughly sculptured, coarsely punctate; anterior margin yellow; median carina percurrent, yellow; lateral carinae extending from above eyes to tip of pronotal process, yellow; pronotal process heavy, rising above the head and slightly curved backwards, tip flattened, not bifurcate, suddenly produced posteriorly in a short process; posterior process heavy, base yellow, median lobe high, arcuate, dorsal margin faintly serrate, tip acuminate and just reaching internal angles of tegmina; scutellum well exposed, tip bidentate.

Tegmina coriaceous, opaque, coarsely punctate, mottled brown and yellow; apical limbus broad; apical cells irregular, other areas and veins obliterated; tip acute.

Undersurface of body light brown; legs flavous-brown.

Length from front of head to tips of tegmina 7.3 mm.

Width between tips of humeral angles 2.5 mm.

Height of pronotal process 2.5 mm.

Type: female. Male similar but slightly darker.

Type locality: Mt. Kinabalu, B. N. Borneo. Kiau, 3,000 ft.

Described from sixteen females and nine males. Type and twenty-two paratypes in F.M.S. collection; allotype and one paratype in author's collection.

This species is apparently close to Goding's *P. cornuta* which was also described from Borneo, but is larger and very different in color, particularly the broad yellow band at the base of the posterior process and the mottled tegmina.

4. **Maguva cornuta** sp. n. (Fig. 4).

Large, brown, pubescent, punctate; suprahumeral horns heavy, triangular, projecting outward and slightly upward; posterior process slender, sinuate, reaching just to internal angles of tegmina; tegmina hyaline, base opaque brown; five apical and four discoidal areas; legs and undersurface of body dark brown.

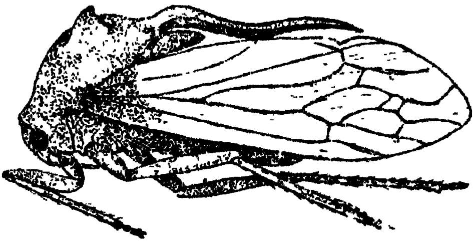


Fig. 4. *Maguva cornuta* sp. n.

Head wider than long, brown, roughly sculptured, strongly pubescent; base arcuate with a tubercle on each side median line; eyes large, black; ocelli large, yellow, equidistant from each other and from the eyes and situated about on a line drawn through centers of eyes; inferior margins of genae sinuate; clypeus twice as long as wide, extending for three-fourths its length below inferior margins of genae.

Pronotum brown, coarsely punctured, sparingly pubescent; metopidium sloping, broader than high; median carina percurrent; humeral angles strong, triangular; suprahumeral horns strong, triangular, flattened dorsoventrally, not as long as the distance between their bases, extending outward and slightly upward with tips curved backward; scutellum entirely exposed, tip rounded; posterior process sinuate, tricarinate, tip sharp and just reaching internal angles of tegmina.

Tegmina hyaline, base opaque, coriaceous, brown and punctate; veins strong; four discoidal and five apical cells; terminal cells irregularly arcuate; no apical limbus.

Sides of thorax gray tomentose; undersurface and abdomen dark brown; femora and tibiae shining dark brown; tarsi and claws black.

Length from front of head to tips of tegmina 8.5 mm.

Width between tips of suprahumerals 4 mm.

Type: female.

Type locality: Mt. Kinabalu, B. N. Borneo. Lumu Lumu, 5,500 ft.

Described from a single specimen. Type in F.M.S. Museum collection.

5. **Hybandoides horizontalis** Distant.

A series of twenty-three specimens collected at an altitude of 3,000 ft. (Kiau). This species was originally described from Mt. Kinabalu and it is therefore not surprising that a good series should be represented in this collection. The specimens show a rather wide variation in the length and degree of curvature of the pronotal horn but there is nothing to suggest specific differences.

6. **Emphusis malleus** Walker.

Two specimens from the 3,000 ft. elevation (Kiau). This species has been reported from many parts of India and Archipelago. It is apparently an abundant and well distributed species in the Malayan region. It was originally described from Ceylon.

7. **Centrotypus asmodeus** Distant.

One specimen labeled " nr. Kinabalu, Kabayau. 600 ft." This is another species common to the Malayan region and has been reported previously from Borneo (Funkhouser, J. R. A. S., 82: 206, 1920).

8. **Leptocentrus obortus** Distant.

Two specimens taken by Mr. Pendlebury on April 16, 1929 at an elevation of 5,500 feet, (Lumu Lumu), the highest elevation given on any of the labels in this collection. This species, also, seems to be common to the region and was recorded from Borneo (Funkhouser *ibid.*) in material collected by the late Professor Baker at Sandakan.

9. **Tricentrus caliginosus** Walker.

Six specimens taken at altitudes ranging from 600 to 3,000 feet. This is the first record of this species from Borneo but it has been commonly reported from the Malay Archipelago. It was originally described from Malacca.

10. **Tricentrus spinidorsis** Funkhouser.

Two specimens from the 3,000 ft. elevation (Kiau). This species was described in 1929 from material taken by Mr. C. Boden Kloss and Mr. H. M. Pendlebury at Kudat, North Borneo. It has not been mentioned in the literature of the family since, and so far as the records show is strictly a Bornean species.

11. **Tricentrus kriegeli** sp. n. (Fig. 5).

Large, black, punctate, pubescent; suprahumeral horns heavy, triangular, extending outward and upward; posterior process somewhat sinuate, tip depressed and reaching just beyond internal angles of tegmina; tegmina smoky-hyaline, base and costal margin black; legs and undersurface black.

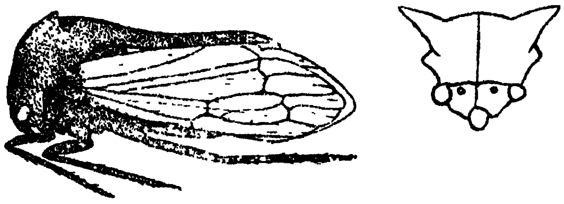


Fig. 5. *Tricentrus kriegeli* sp. n.

Head wider than long, black, finely punctate, sparingly pubescent with silvery hairs; base sinuate; eyes large, drab; ocelli small, drab, twice as far from each other as from the eyes and situated well above a line drawn through centers of eyes; inferior margins of genae rounded; clypeus twice as long as wide, extending for half its length below inferior margins of genae.

Pronotum entirely black, finely punctate, sparingly pubescent; metopidium wider than high, sloping; median carina faintly percurrent; humeral angles heavy, triangular; suprahumeral horns short, heavy, triangular, about as long as the distance between their bases, extending outward and upward; scutellum well exposed on each side, black, punctate, pubescent; posterior process slightly sinuate, tectiform, tricarinate, impinging on tegmina, tip depressed, acute, reaching just beyond internal angles of tegmina.

Tegmina smoky-hyaline, wrinkled; base narrowly black, coriaceous and punctate; costal margin black; five apical and three discoidal cells; apical limbus broad.

Legs and undersurface of body entirely black.

Length from front of head to tips of tegmina 6.5 mm.

Width between tips of suprahumerals 3 mm.

Type: female.

Type locality: Mt. Kinabalu, B. N. Borneo. Kenokok, 3,300 ft.

Described from a single specimen. Type in F.M.S. collection.

This species bears a superficial resemblance to *T. nigris* Funkh., which was also described from Borneo, but differs greatly .in the shape and position of the suprahumerals and in the hyaline tegmina.

12. Tricentrus nivis sp. n. (Fig. 6).

Brown, punctate, pubescent, large snow white tomentose patch on sides of thorax and under base of tegmina; suprahumeral horns extending outward and upward, as long as the distance between their bases; posterior process straight, just reaching internal angles of tegmina; tegmina brown, nearly opaque, base dark brown followed by white tomentose area below; undersurface brown.

Head subquadrate, wider than long, finely punctate, densely pubescent with short golden hairs; base arcuate; eyes large, brown; ocelli large, brown, a little farther from each other than from the eyes and situated well above a line drawn through centers of eyes; margins of genae sinuate; clypeus twice as long as wide, extending for half its length below inferior margins of genae, tip rounded, pilose.

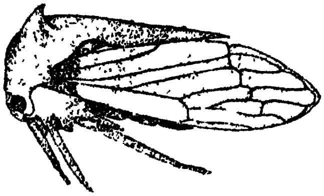


Fig. 6. *Tricentrus nivis* sp. n.

Pronotum brown, finely punctate, densely pubescent with short golden hairs; median carina faintly percurrent; metopidium sloping, broader than high; humeral angles large, prominent, triangular; suprahumeral horns strong, tricarinate, about as long as the distance between their bases, extending upward and outward, tips sharp and curving slightly backward; scutellum well exposed on each side; posterior process straight, impinging on tegmina, tricarinate, tip sharp, just reaching internal angles of tegmina.

Tegmina brown, semiopaque; base opaque, brown and punctate; a snow white patch showing through just behind base; five apical and three discoidal cells; apical limbus narrow.

Sides of thorax entirely covered with snow white tomentose patch. Legs and undersurface of body uniform brown.

Length from front of head to tips of tegmina 6 mm.

Width between tips of suprahumerals 3.7 mm.

Type: female.

Type locality: Mt. Kinabalu, B. N. Borneo. Lumu Lumu, 5,500 ft.

Described from three specimens, all females, two from the type locality and one from the 3,000 ft. elevation. Type and one paratype in F.M.S. collection; one paratype in author's collection.

This species is close to *T. horizontalis* Distant, which it resembles because of the white tomentose patches, but is much larger and quite different in the shape and inclination of the suprahumeral horns.

13. **Tricentrus pilosis** sp. n. (Fig. 7).

Small, brown, very hairy, punctate; suprahumerals not as long as the distance between their bases, extending upward and outward; posterior process heavy, tip slightly depressed, extending just beyond internal angles of tegmina; tegmina brown, semiopaque, base coriaceous and punctate, a faint white band behind base; legs and undersurface uniform dark brown.

Head subquadrate, brown, pilose; base arcuate; eyes large, light brown; ocelli large, light brown, equidistant from each other and from the eyes and situated well above a line drawn through centers of eyes, margins of genae sinuate; clypeus twice as long as wide, extending for half its length below inferior margins of genae, tip truncate.

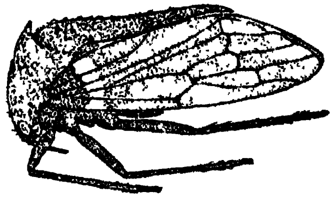


Fig. 7. *Tricentrus pilosis* sp. n.

Pronotum brown; punctate, densely pilose; metopidium sloping, broader than high; median carina faintly percurrent; humeral angles prominent, triangular; suprahumeral horns extending upward and outward, not quite as long as the distance between their bases, tricarinate, flattened dorsoventrally, tips acute; scutellum well exposed on each side; posterior process nearly straight, heavy, tricarinate, tip slightly depressed and reaching slightly beyond internal angles of tegmina.

Tegmina brown, subopaque, veins pilose; base narrowly dark brown, coriaceous, opaque, pilose, followed by a lighter translucent band; five apical and three discoidal cells; apical limbus narrow.

Sides of thorax, legs, and undersurface of body dark brown, pilose; trochanters armed with spines.

Length from front of head to tips of tegmina 5.9 mm.

Width between tips of suprahumerals 3.4 mm.

Type: female.

Type locality: Mt. Kinabalu, B. N. Borneo. Kiau, 3,000 ft.

Described from a single specimen. Type in F.M.S. collection.

14. **Gargara nigrofasciata** Stal.

Two specimens collected on March 16–17, 1929 at the 3,000 ft. elevation. This species is well distributed over the archipelagic region and has been twice previously reported from Borneo. (Funkhouser, 1920, J. R. A. S., 82: 220; 1929 Bornean Membracidae 476).

15. **Gargara pulchripennis** Stal.

Five specimens, all taken at the altitude of 3,000 ft. This species is also apparently common throughout the region and was reported (Funkhouser *ibid.*) previously from two collections made in Borneo.

16. **Gargara granulata** Funkhouser.

One specimen of this very interesting and apparently rare species taken at the elevation of 3,000 feet. This species was originally described from the Philippines and this is the first record from Borneo.

17. **Gargara nitidipennis** Funkhouser.

Four specimens, all from Mt. Kinabalu, but three labeled "Kiau, 3,000 ft." and one "Kenokok, 3,300 ft." This is another species which has been recorded from many parts of the Malayan area. It was originally described from the Philippines but a specimen was taken in Borneo by Professor Baker in 1917. (Funkhouser, J. R. A. S., 82: 219).

18. **Gargara varicolor** Stal.

Four specimens all labeled "Kiau, 3,000 ft." Another widely distributed species which has previously been taken in Borneo both by Professor Baker and Mr. Pendlebury. (Funkhouser, *ibid.* 1920; 1929).

19. **Gargara sumbawae** Funkhouser.

Three specimens labeled "Tenompok Pass, 4,700 ft." which agree in all specific characters with the type material of the species from Sumbawa Island. It is interesting to find this species, which has not been reported since its original description, in this Bornean material.

20. **Gargara penangi** Funkhouser.

One specimen taken at Tenompok Pass, 4,700 ft., which seems identical with the type specimen from Penang which was described in 1918 (Funkhouser, Malayan Memb. 11) from material collected by Professor Baker. This is the first record from Borneo.

IV. A COLLECTION OF RUTELINAE (COL: SCARABAEID:) FROM MT. KINABALU, BRITISH NORTH BORNEO.

By F. OHAUS, *Mainz.*

(With four text figures)

The following species were collected by Mr. H. M. Pendlebury during a visit to Mount Kinabalu in 1929.

List of Species.

1. **Parastasia kinabalensis** Ohs.
Mt. Kinabalu: Tenompok Pass, 4,700 feet, April 18 1929, 1 ♀.

2. **Parastasia confluens** Westw.
Kabayau, 600 feet, May 11 1929. ♂.

3. **Rutelarcha quadrimaculata** Waterh.
Kiau, 3,000 feet, March 29—April 16, 1929, ♂ ♀. Koung to Kabayau, 800 feet, May 6 ♀.
[The colour of the elytra of these beetles in life is scarlet, this rapidly changes after the insect is killed. H.M.P.]

4. **Fruhstorferia kinabalensis** sp. n. (see page 123).
Lumu Lumu, 5,500 feet, at light, April 7 and 8, 1929. ♂ ♀.

5. **Anomala (sens. str.) aelia** sp. n. (see page 124).
Kiau, 3,000 feet, March 16, 1929. ♂.

6. **An. biformis** Arr.
Koung, 1,300 feet, March 14 and 15, 1929, ♂.

7. **An. cochlearia** sp. n. (see page 125).
Kenokok, 3,300 feet, April 22, ♂. Marei Parei, 5,500 feet, April 28, 1929. ♂.

8. **An. fulvochalceata** Ohs.
Kabayau, 600 feet, March 14, 2 ♂ ; May 9, ♀. Kiau, 3,000 feet, March 15, ♂.

9. **An. fuscula** Sharp.
Koung, 1,300 feet, May 5, ♀. Kabayau, 600 feet, May 8, 1929, ♀.

10. **An. gordiana** sp. n. (see page 125).
Kamborangah, 7,200 feet, March 26, ♂ ♀. Lumu Lumu, 5,500 feet, April 11–16, 1929 ♂ ♀.

11. **An. kinabalensis** Ohs.
Koung, 1,300 feet, March 15, 2 ♀. Kiau, 3,000 feet, March 15, ♀. Marei Parei, 5,000 feet, April 28, 1929. ♂.

12. **An. kudatina** Ohs.
Koung, 1,300 feet, March 15, 1929 ♂.

13. **An. prolixa** Arr.
Kamborangah, 7,200 feet, March 23—April 1, 1929.
All the specimens of this species, found now and in earlier times by Whitehead and Waterstradt are ♀ ♀ ; the ♂ is unknown.

14. **An. rotundiceps** Sharp.
Kiau, 3,000 feet, March 25—April 9, 1929, ♂ ♀.

15. **An. silama** Arr.
Koung, 1,300 feet, March 15. Kiau, 3,000 feet, April 1—24, 1929, ♂ ♀.

16. **An. teretina** sp. n. (see page 126).
Lobang, 4,000 feet, April 5, ♂. Tenompok Pass, 4,700 feet, April 18–19, ♂ ♀. Lumu Lumu, 5,500 feet, April 6–14, 1929, ♂ ♀.

17. **An. (Euchlora) latefemorata** Ohs.
Koung, 1,300 feet, March 15. Kabayau 600 feet, March 14, May 18, 1929, ♀ ♀.

18. **Mimela maculicollis** Ohs.
Kiau, 3,000 feet, April 18, 1929, ♂.

19. **Mimela margarita** Arr.
Kenokok, 3,300 feet, April 24, 1929, ♂ ♀.

20. **Chaetadoretus trichostigma** Ohs.
Kiau, 3,000 feet, April 3, 1929, ♀.

21. **Lepadoretus compressus** Web.
Kabayau, 600 feet, May 9, 1929. ♂.

Descriptions of the New Species.

Fruhstorferia kinabalensis sp. n.

Next allied to *Fr. javana* Klb., of the same robust convex shape but somewhat smaller; upperside brilliant yellow, the head and mandibles, border of the scutellum, abdomen and tarsi, reddish-brown; sterna, femora and mouthparts clothed with long yellowish hairs. Clypeus trapezoidal in the ♂ with the anterior margin straight, parabolic in the ♀ with the anterior margin raised and emarginate; frontal suture forming a straight fine line, interrupted in the middle; forehead flattened in both sexes; vertex somewhat convex, very brilliant and polished, while the forehead and clypeus are covered with great impressed round single points; the mandibles in the ♂ are shaped just as in *Fr. javana*, in the ♀ they are somewhat longer and more acuminate than in this species; the antennal club is of equal length in both sexes. Pronotum broad and convex, the sides dilated before the middle, anterior and posterior angles obtuse and slightly rounded, a median line is more deeply impressed in the ♂ than in the ♀, the surface is highly polished and sprinkled with single round points like the head. Scutellum broader than long, with a few fine points. Elytra brilliant with regular rows of shallow small points on the disk, and some irregular sparse points in the interstices: the epipleura are broad, reaching to the hind angles of the first abdominal sternite, and here are somewhat prominent in the ♀. Pygidium triangular, somewhat shorter in the ♀, smooth and brilliant in both sexes, with some shallow points at the sides and on the apex, bearing short erect yellowish hairs. Underside, legs and antennae in the ♀ uniformly brilliant brown, while in the ♂ all the femora, and the tibiae and tarsi of the intermediate and hind legs are yellowish. Anterior tibiae in the ♂ prolonged and somewhat thickened, the anterior of the two lateral teeth near the apical tooth, anterior tarsi thickened, he inner claw simple, while on the intermediate and hind the legs the longer claw is deeply cleft; in the ♀ on all the legs the longer claw is deeply cleft.

Long. 22–23 mm; lat. 13 mm. ♂ ♀. British North Borneo: Mt. Kinabalu, Lumu Lumu, 5,500 feet, at light, (H. M. Pendlebury coll.).

Anomala (s. str.) aelia sp. n. (Fig. 1.)

Nearest allied to *A. dapitana* Ohs., from Dapitan Id., Philippine Islands. Oblong-ovate, moderately convex, uniformly dark brassy-green, upperside and legs brilliant with coppery reflections, pygidium and underside densely covered with yellow hair. Clypeus parallel-sided with rounded angles and slightly elevated borders, like the forehead densely and confluently punctured, while the vertex is slightly punctured. Pronotum densely and mostly singly (only at the sides here and there confluently) punctured, lateral foveae present, basal sulcus before the scutellum shortly interrupted. Scutellum with sparse single punctures. In the elytra the sutural costa is quite smooth and the accompanying first primary row of punctures alone is sulcate, while all the remaining surface of the elytra is covered with very numerous rows of singly impressed punctures, the rows regular on the disk, more or less interrupted by short transverse little folds at the sides. Pygidium very densely and finely transversely aciculate, opaque, covered with yellow appressed hair, becoming longer towards the apex. Abdominal sternites and and metasternum smooth and brilliant in the middle, confluently punctured and densely hairy at the sides. In the anterior tibiae the apical tooth is long and acute, the lateral tooth very short and obtusangular; the intermediate and posterior tibiae have only indistinct transverse row of setae. Antennal club in the ♂ as long as the stem. Shape of the aedeagus as in figure 1.

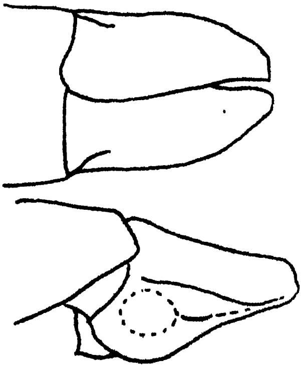


Fig. 1. *Anomala aelia* sp. n.

Long: 11½, lat. 5½ mm. ♂. B. N. Borneo: Mt. Kinabalu, Kiau, 3,000 feet, 16. iii. 29 (H. M. Pendlebury coll.)

Anomala cochlearia sp. n. (Fig. 2).

Similar in shape to *An. teretina*, oblong-ovate, somewhat broadened behind, convex, brilliant testaceous with dark brown markings and metallic green lustre, sides of the pygidium and underside with sparse grey hairs. Clypeus trapezoidal with rounded angles and very slightly elevated borders, the surface like the flattened forehead densely confluently, the vertex singly punctured; inner border of the eyes with three long, erect, setae; clypeus and forehead testaceous, vertex dark brown. Pronotum testaceous with two dark brown stripes in shape of a V, sulcate all around except just before the scutellum, and like this densely and somewhat coarsely singly punctured. The elytra have regular rows of coarse punctures, which near the apex are more sulcate than on the disk; ground colour testaceous with dark markings behind the scutellum, along the suture and the sides, and with a whitish-yellow transverse vitta on the disk and small patches at the sides. Last abdominal segment (tergite and sternite) testaceous with green metallic lustre, densely and coarsely confluently punctured with long setae along the borders. Abdomen and sterna dark brown with metallic lustre, the legs pale testaceous with green and coppery lights. Anterior tibiae with a strong lateral tooth behind the long stout apical tooth. Antennae testaceous, the club shorter than the stem. In the aedeagus, fig. 2, the paramera are free and symmetrical, the apical part of the median lobe is very long and stout, shaped like a spoon (cochlear).

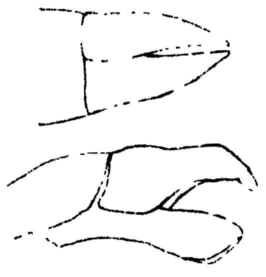


Fig. 2. *Anomala cochlearia* sp. n.

Long. 10, lat. 5 mm. ♂ N. Borneo: Mt. Kinabalu: Kenokok, 3,300 ft. 22.4.29.—Marei Parei 5,000 ft., 28.4.29 (H. M. Pendlebury coll.).

Anomala gordiana sp. n. (Fig. 3).

Next allied to *A. teretina* but larger and broader behind. Oblong-ovate, convex, above and beneath brilliant testaceous, the head (forehead and vertex) and two great patches on the disk of the pronotum, the metasternum, tibiae and tarsi brown with coppery or metallic green lustre; the borders of the eyes, pronotum and elytra, the abdomen and legs sparsely, the metasternum thickly clothed with long yellowish hair. Clypeus parallel-sided with elevated borders, like the forehead densely and coarsely rugose, vertex densely singly punctured, the frontal suture straight. Pronotum finely margined all round except before the scutellum, a median sulcus sometimes indicated, the sides regularly rounded, the anterior angles produced, the somewhat obtuse hind angles not rounded, the surface finely and dispersely punctured. Scutellum with some very faint punctures. Elytra regularly punctate-sulcate, the subsutural interstice somewhat flattened behind the scutellum, the two secondary costae therein separated by irregular punctures near to the apex. Pygidium confluently punctured, the punctures at the base and on the disk finer and more densely set, at the apex becoming coarser, more isolated, and here bearing long reddish hairs. Abdominal sternites and metasternum densely covered with coarse annulate punctures, which bear long setae. Legs long and stout; anterior tibiae with a stout lateral tooth behind the long spoon-like apical tooth; intermediate and hind tibiae with two transverse bristle-edges; the inner claw of the anterior tarsi in the ♂ feebly dilated. Antennal club in the ♂ as long as the stem, somewhat shorter in the ♀. In the aedeagus, fig. 3, the paramera are symmetrical and free, the ventral plate at the apex deeply emarginate.

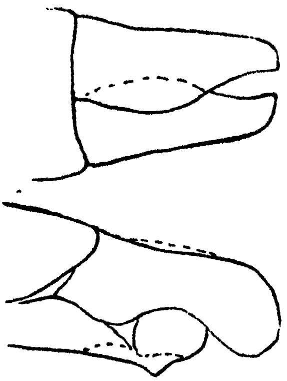
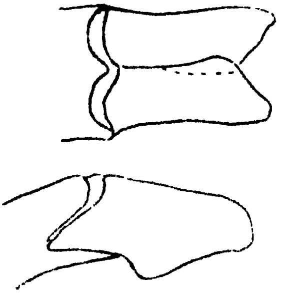


Fig. 3. *Anomala gordiana* sp. n.

Long. 15–17, lat. 8–9 mm. ♂ ♀. Mt. Kinabalu: Lumu Lumu, 5,500 ft. 11–16.4.29.—Kamborangah, 7.200 ft. 26.3.29 (H. M. Pendlebury coll.).

Anomala teretina sp. n. (Fig. 4).

Oblong, slender the ♀ somewhat broadened behind, moderately convex, head, thorax and scutellum dark brown with metallic green lustre, the clypeus and the sides of pronotum yellow, the elytra uniform testaceous, or testaceous with a brown spot around the scutellum, or entirely dark brown not metallic, pygidium, underside, legs and antennae uniform testaceous; in the specimens with dark elytra the tibiae and tarsi alone are metallic brown-green; the forehead, borders of pronotum, elytra and pygidium, the abdomen and legs are sparsely, the sterna densely clothed with long yellowish hairs. Clypeus twice as broad than long, the sides nearly parallel the borders slightly elevated, the surface like that of the flattened forehead finely and densely rugose, the vertex alone with coarser single punctures; frontal suture fine and straight. Pronotum finely margined all around, the basal sulcus not interrupted before the scutellum, a discal median impression indicated, sides regularly rounded, anterior angles slightly projecting, posterior angles nearly rectangular not rounded, surface somewhat strongly and mostly singly punctured. Scutellum with some single punctures and smooth sides. Elytra regularly punctate-sulcate, primary and secondary costae equally convex, in the subsutural interstice the two secondary costae are separated by a line of points irregularly doubled from base nearly to the apex. Pygidium coarsely confluently punctured with long greyish hair at the sides and apex. The whole underside, abdominal segments and sterna, are very coarsely rugose-punctate, the abdominal sternites with the ordinary transverse row of setae, the metasternum thickly, the legs more sparsely clothed with long hair. Legs long and slender, anterior tibiae with a sharp lateral tooth behind the apical tooth, the intermediate and hind tibiae with two oblique bristle-edges. Claws long and slender, the anterior inner claw in the ♂ not much thickened. Antennal club in the ♂ as long as the stem, in the ♀ somewhat shorter. Aedeagus fig. 4. Long. 10½–13½, lat. 5½–6½ mm. ♂ ♀. Mt. Kinabalu: Lobang, 4,000 ft. 5.4.29.—Lumu Lumu, 5,500 ft. 6–14.4.29.—Tenompok Pass, 4,500 ft. 18–19.4.29.



Fgi. 4. *Anomala teretina* sp. n.

Closely allied to *A. ulcerata* Ohs. from W. Borneo: Nyabang, but more slender, the elytra more deeply sulcate, the tibiae longer and more slender, underside more hairy and shape of aedeagus quite different.

V. SOME RUTELINAE FROM THE LOWLANDS OF BRITISH NORTH BORNEO.

By F. OHAUS, *Mainz.*

(With one text figure.)

The twelve species enumerated below were collected by Messrs. C. Boden Kloss and H. M. Pendlebury during a visit to the lowlands of North Borneo in 1927. The localities where the material came from are:

Samawang. About twenty-five miles west by north of Sandakan: swampy coastal country and small forested hills penetrating into the nipah palm area which fills the estuary of the Samawang river.

Bettotan. About twenty-two miles west by north of Sandakan, up the Bettotan river which runs into the head of Sandakan Bay: a cleared, partially cleared, and forested expanse of undulating low-country.

Kudat. On the north-western point of the island: cultivated, or grass and scrub covered country with a few small patches of forest.

1. **Anomala (Aprosterna) breviuscula** Sharp.
Bettotan, 21. viii. 27, ♂.

2. **An. (sens. str.) diversicolor** Ohs.
Samawang, 6. vii. 27, ♂ ♀, at light.

3. **An. fuscula** Sharp.
Bettotan, 25. vii—4. viii. 27, 3 ♀ ♀ ; 5. viii. 27, ♂.

4. **An. heterostigma** Ohs.
Bettotan, 25. vii. 27, ♀.

5. **An. limata** Cand.
Bettotan, 23. vii. 27, 2 ♀, at light.

6. **An. sulcatula** Eschz.
Balambangan Id., 28. ix. 27, ♂ ♀ ; Jesselton, v. 29, ♂ ; Kudat, 1–17. ix. 27, ♂ ♀ ; Samawang, 6–14. vii. 27, ♂ ♀.
This species was first described from and is common in the whole Philippines archipelago.

7. **An. (Euchlora) latefemorata** Ohs.
Samawang, 9. vii. 27; Bettotan, 15. viii. 27, ♀ ♀.

8. **An. matricula** Ohs.
Kudat, 1–21. ix. 27 ♂ ♀ ; Balambangan Id. 28. ix. 27, ♀.
A somewhat smaller insular form was found by Mr. Boden Kloss on Mangalum Id. (about 35 miles north west of Jesselton) 8–15. vii. 28. 12–13½ mm. ♂ ♀.

9. **Popillia sandyx** Newm. **borneensis** Krtz.
Kudat, 6–18. ix. 27, ♂ ♀.

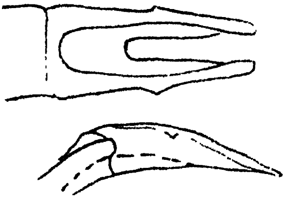
10. **Chaetadoretus trichostigma** Ohs.
Bettotan, 17. viii. 27, ♀.

11. **Lepadoretus compressus** Web.

Bettotan, 13. vii—20. viii. 27, ♀, at light, Samawang, 13. vii. 27, at light.

12. **Lepadoretus klossi** sp. n.

Nearest allied to *L. moultoni* Ohs., from Sarawak, shorter, flatter, and broader, chestnut brown feebly resplendent, densely confluently punctured and covered with short yellowish appressed scales. Clypeus semicircular with the margin feebly reflexed in both sexes, the frontal suture straight; head very large, eyes not very prominent; rostrum and labrum with a median carina, their sides smooth; antennal club short in both sexes. Pronotum very broad, the sides somewhat dilated, the anterior angles produced, the obtuse hind angles feebly rounded. Elytra with convex primary costae upon which the scales alternatively become sparser and condensed to small spots, broadest upon the apical calli. Pygidium broad and short, with a median bare line and longer hairs upon the disk. Legs short with broadened tibiae; in the anterior tarsi the inner claw is slender and nearly equally cleft in both sexes; the outer claw of the intermediate tarsi is thickened, angulated near the base and very unequally cleft in the ♂. Shape of aedeagus as in figure.



LEPADORETUS KLOSSI SP. N.

Long. 10–11, lat. 5–5½ mm. ♂ ♀ .Kudat, 5–15. ix. 27, (C. Boden Kloss and H. M. Pendlebury).

VI. MALAYAN RUTELINAE IN THE COLLECTION OF THE FEDERATED MALAY STATES MUSEUMS.

By F. OHAUS, *Mainz.*

(Four text figures).

The sixty two species enumerated in this paper have been sent to me for determination from the Federated Malay States Museums; the type specimens of the six new species described herein are in the collections of the Selangor Museum, Kuala Lumpur, and in that of the author.

List of Species.

I. Tribus *RUTELINI.*

1. **Lutera luteola** Westw.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000 feet. 24.3.1922 (H. M. Pendlebury coll.)—Malay Peninsula: Kedah Peak, 3,300 feet. 13.3.1928, at light (H. M. Pendlebury coll.)—Perak, F.M.S. Batang Padang: Jor Camp, 2,000 feet, 9.3.1921 (H. M. Pendlebury coll.) 3 ♂.

The species has been described from Borneo, Sarawak, and is also recorded from the Island of Adonara (Doherty coll. ex Mus. Tring), from Java: Mt. Kawie (Ledru coll.), from Sumatra: Medan, from the Nicobar Islands and from Siam: Bangkok. Dr. C. A. Dohrn, who in the "Stettin, Ent. Zeit. v. 47, 1886" notes the locality: Bangkok, had in his collection also some specimens labelled: Himalaya, that is because I noted that locality in my catalogue.

The genus *Lutera* Westw., is not synonymous with the genus *Parastasia* Westw., as Mr. G. J. Arrow notes in his "Fauna of British India," Col. Lamell., part II, *Rutelinae,* 1917, p. 36. In *Parastasia* the frontal suture, separating the clypeus from the forehead, is interrupted in the middle and elevated at the sides, forming here more or less high teeth. In *Lutera, Cyphelytra* and *Rutelarcha* on the contrary this frontal suture, also interrupted in the middle, at the sides is sulcate (furrowed), and not at all elevated or toothlike. Fresh and well preserved specimens of this are nearly white, with dark brown markings.

2. **Parastasia anomala** Arr.

Malay Penins. West Coast: Langkawi Island, 18.4 and 20.4.1928 (H. M. Pendlebury coll.)

3. **P. bimaculata** Guer.

Malay Penins. West Coast: Langkawi Id., 18–25.4.1928 (H. M. Pendlebury coll.) Carey Id., 2.2.1916 (ex coll. Agric. Dept.).

The species is distributed from the Andamans and the the Malay Peninsula in the west to the Solomon Islands in the east. In the Island of Buru Mr. Toxopeus found beetles, grubs and chrysalids of this species in rotten coconut trunks.

4. **P. confluens** Westw.

Malay Penins. N. Sembilan: Bukit Tangga, 600 ft. 19.11.1919 (H. C. Abraham coll.) Labuan Padang, 7.7.1907 (C. B. Holman-Hunt coll. in coll. Agric. Dept.) Selangor: Kuala Lumpur, 31.3 and 5.4.1931, at light (H. M. Pendlebury coll.) Bukit Kutu, at light, 17.4.1926, 3,500 feet (H. M. Pendlebury coll.).

This species is also widely distributed, from the Nicobars, where Mr. Roepstorf found beetles, grubs and chrysalids in rotten trees, to the western part of New Guinea.

5. **P. klossi** Ohs.

Malay Penins. Selangor: Bukit Kutu, 3,500 ft., 12–29.4.1926; 8–9.9.1929 (H. M. Pendlebury coll.) Fraser's Hill, 4,000 feet. June, 1921; September, 1923 (ex coll. Agric. Dept.)

6. **P. melanocephaloides** Ohs.

Malay Penins. Selangor: Bukit Kutu, 3,000–3,600 ft. April, 1915.

II. Tribus *ANOMALINI.*

7. **Anomala** (subgen. **Aprosterna**) **antiqua** Gyll.

Malay Penins. Perak: Batu Gajah, 16.4.1927, at light. Selangor: Kuala Lumpur, 12.9.1918, at light—Gombak Valley, 21.5.1927—Kedah: Alor Star, 12.4.1928—W. Coast: Langkawi Isld. 16–27.4.1928—Penins. Siam: Nakon Sri Tamarat: Khao Ram, 1,500–3,000 ft. 2.3.1922; Patalung, Trang: Nawongse, 4.5.1924; Banchong, 20.3.27, at light.

The species is distributed from China, south of the Yang-tse-Kiang in the north and Nepal in the west, to Queensland, Australia, in the east. Leefmans stated that the grubs in Java and Sumatra are dangerous to cultivated plants, and I believe that the species has been transported in the stage of egg or quite young grub in earth wrapping the roots of such plants as bananas, colocasias, manihot, which are transported for cultivation.

8. **Apr. breviceps** Sharp.

Malay Penins. Selangor: Kuala Lumpur, 10.1–30.9—Bukit Kutu, 3,500 feet. 19.4.26.—Kedah Peak, 2,500–3,000 ft. 23.3.28—Penins. Siam: Nakon Sri Tamarat: Khao Luang, 2,000 feet, 21.3. 22. All at light.

Described from Sumatra.

9. **Apr. pallida** F.

Selangor: 18.1.–19.10. all found at light.

The species is common in Java and Sumatra, and perhaps transported with culture-plants.

10. **Anomala (sensu stricto) aureola** Hope.

Penins. Siam: Nakon Sri Tamarat: Khao Ram, 300–750 feet, 21.2–3.3.1922 (H. M. Pendlebury coll.) Kedah, catchment area, near Jitra, 3.4.28—Perak, Taiping.

Restricted to the Malay Peninsula.

11. **An. brevidens** Ohs.

Penins. Siam: Patalung Trang: Ban Chong, 2.4.1924, at light (I. H. N. Evans coll.)

Described from Kambodja.

12. **An. deliana** Ohs.

Malay Penins. W. Coast: Langkawi Isld. 22–26.4.1928.—Selangor: Kuala Lumpur, 15.2.1928.—Perak: Batang Padang: Tapah, 6.3.1928, all coll. by H. M. Pendlebury; Tumpat, Kelantan, 28.7.26 (C. Boden Kloss coll.)
The species was described and only known hitherto from Sumatra.

13. **An. holomelaena** H. Bts.

Malay Penins, Perak: Taiping, March, 1929 (H. C. Abraham coll.) Kampar, 18.3.24, at light (B. R. Sulaiman) Selangor: Gully, Swettenham Road, Kuala Lumpur, January, 1921, 21.12.1924 (H. M. Pendlebury)—Penins. Siam: Nakon Sri Tamarat: Khao Kao, 21.2.1922, at light. (H. M. Pendlebury coll.) Perak: Batang Padang, Jor Camp, 30.1.1925.

The species has been reported erroneously as coming from N. W. India: Kulu district.

14. **An. kinabalensis** Ohs.

Malay Penins. Selangor: Bukit Kutu, 3,500 feet, at light 15.4.1926 (H.M.Pendlebury).

15. **An. lasiocaula** Ohs.

Penins. Siam: Nakon Sri Tamarat, Khao Luang, 2,000 feet, 18.3., 1.4.1922, at light (H. M. Pendlebury coll.)

16. **An. limatipennis** Ohs.

Malay Penins. W. Coast: Langkawi Isld. 24.4. 1928 (H. M. Pendlebury coll.)

Described from Sumatra.

17. **An. obsoleta** Blanch.

Malay Penins. W. Coast: Langkawi Isld. 16.4. 28 (H. M. Pendlebury coll.)

Distributed from British India to New Guinea and probably transported with cultivated plants.

18. **An. pagana** Burm.

Penins. Siam: Nakon Sri Tamarat: Khao Luang, 2,000 feet, 15.3–3.4. 1922, at light (H. M. Pendlebury coll.)

First described from Java and also found in Sumatra and W. Borneo.

19. **An. pendleburyi** Ohs. sp. n. (see page 139).

Malay Penins. Selangor: Bukit Kutu, 20.4.1926.—Kedah Peak, 3,300 feet, 9–25.3.1928 (H. M. Pendlebury coll.)

20. **An. rotundiceps** Sharp.

Malay Penins. W. Coast: Langkawi Isld. 20.30. 4.1928.—Pahang: Lubok Tamang, 3,500 feet, 10.3. 1924, at light, H. M. Pendlebury. Penins. Siam Patalung and Trang, 22.4–4.5.1924, at light, I. H. N. Evans.

The species is common in Sumatra and Borneo.

21. **An. saetipes** Ohs.

Malay Penins. Selangor: Ginting Bidai, 2,000 feet. (C. Boden Kloss coll.)—Kuala Lumpur, 6–7.4.1931, at light (H. M. Pendlebury coll.)

Described from Sumatra and also found in Java and Borneo.

22. **An. silama** Arr.

Malay Penins. Perak: Batang Padang: Jor Camp, 1,800 feet, 3.6.23 (H. M. Pendlebury coll.)—Pahang: Renglet Camp, 3,500 feet, April, 1929 (H. C. Abraham coll.)

Described from Borneo and recorded from Sumatra.

23. **An. sordidula** Sharp.

Malay Penins. Perak: Taiping, 20.2.1924, at light—Batu Gajah, 16.4.27, at light (H. M. Pendlebury).

Described from Perak, but also found in Sumatra.

24. **Anomala** (subgen. **Spilota**) **catoptrica** Ohs.

Malay Penins. Kuala Selangor, Riverside Est., September, 1907 (C.B. Holman-Hunt coll). Selangor: Bukit Kutu, 3,400 feet, August, 1915.

Described from Sumatra.

25. **Sp. excellens** Nonfr.

Malay Penins. W. Coast: Langkawi Isld. 25.4.1928—Selangor: Bukit Kutu, 3,500 feet, 13–29.4.1926, at light (H. M. Pendlebury coll.)

Described from Borneo, but also found in Sumatra and Nias.

26. **Sp. lubrica** Ohs.

Malay Penins. Selangor: Bukit Kutu, 2,500 feet, 18.4, 3,450 feet 19.4.26.—Perak: Taiping; Batang Padang, Jor Camp, 2,000 feet, 26.5.1923—Pahang: Fraser's Hill, 4,000 feet, 2.1–2.2.1930; 4,200 feet, 26.5.1926; The Gap, 2,700 feet, January; Lubok Tamang, 3,500 feet, 9.6.1923; all collected by H. M. Pendlebury.

Described from Sumatra.

27. **Sp. malaya** Ohs. sp. n. (see page 140).

Malay Penins. Selangor: Bukit Kutu, 3,500 feet, 14–20.4. 1926 (H. M. Pendlebury coll.)

28. **Sp. morio** Ohs.

Malay Penins. Kedah Peak, 2,500–3,950 ft. 13–27.3.1928—Penins. Siam: Nakon Sri Tamarat: Khao Luang, 2,000 feet, 26.3.22 (H. M. Pendlebury coll.)

Described from W. Borneo.

29. **Sp. moultoni** Ohs.

Malay Penins. Kedah Peak, 3,300–3,600 feet, 20.4.1930 (H. T. Pagden coll.)

Described from W. Borneo.

30. **Sp. spinifera** Ohs.

Malay Penins. Selangor: Bukit Kutu, 3,500 ft. 13.4.1926, at light (H. M. Pendlebury coll.)—Penins. Siam: Nakon Sri Tamarat, 2,000 ft., 15.4.1922, at light (H. M. Pendlebury coll.)

Described from Sumatra.

31. **Sp. sumptuosa** Ohs.

Malay Penins. Selangor—Pahang: The Gap, 2,700 ft. January, 1915. Kuala Lumpur. Pahang: Lubok Tamang, 3,500 feet, 12.6.1923 (H. M. Pendlebury coll.)

Described from Sumatra.

32. **Sp. tigrina** Nonfr.

Malay Penins. Selangor: Ginting Bidai 2,000 ft. (C. Boden Kloss coll.)

Described from Sumatra.

33. **Sp. wallandi** Cand.

Malay Penins. Selangor: Gunong Itam, foothills.

Described from Sumatra and recorded also from Java.

34. **Anomala** (subgenus **Euchlora**) **bicolor** F.

North Borneo: Sandakan, 1 ♂.

35. **E. chalcites** Sharp.

Malay Penins. Perak: Taiping 12.2.25 (E. Seimud coll.). Pahang: Kuala Galong, 22.7.25 (I. H. N. Evans coll.); Kuala Tahan 24.11.21 (H. M. Pendlebury coll.); Pekan, 6.1917. Selangor: Kuala Lumpur, 11.4.27; 17.7.26; 21.8.26 (H. M. Pendlebury coll.); Papua: Astrolabe Mts. 1908 (A. Lousenmeyer coll.) all at light.

36. **E. cupripes** Hope.

Malay Penins. Selangor: Kuala Lumpur, from January to October many specimens, ♂ and ♀, taken at light. Batang Padang: Jor Camp, February—March, 1915.—Kedah Peak, 3,300 ft. 20.3.1928. Pahang: Kuala Tahan, 300 feet, 25.11.1921; Pekan, July, 1917 (ex coll. Agric. Dept.); Rompin, Endau, July, 1917; Ulu Sungei Triang, June, 1930. —Tumpat, Kelantan, 27.7.1926.—Singapore Isld. Mandai, 7.3.1922.—West Coast, Langkawi Isld. 14–25.4.1928.—Penins. Siam: Patalung: Paknam Lampan 30.4.1922.; S. China Sea: Anamba Is: Telok Padang, N. Coast Jimaja, 4.1928, at light (M. R. Henderson coll.)

The species is common in Southern China, Indo China, Burma, Siam and recorded from Formosa, Sumatra, Java and Borneo, probably imported there with cultivated plants.

37. **E. knapperti** Ohs.

Malay Penins: Perak: Jor Camp, 2,000 feet, 25.8.1922. 1 ♂.

Described from Sumatra.

38. **E. matricula** Ohs.

S. China Sea. S. Natuna Is. Pulau Panjang, 9–11.8.31 (P. M. de Fontaine coll.)

39. **E. psittacina** Ohs.

Malay Penins. Selangor: Ulu Gombak, 4.1.1910.—Upper Perak: Temangoh.—Penins. Siam: Nakon Sri Tamarat, 300 feet, 21.2.1922, at light (H. M. Pendlebury coll.); Pahang: Cameron Highlands, 4,800 feet, 28.5.31 (H. M. Pendlebury). Described from Sumatra and Java.

40. **E. pulchripes** Sharp.

Malay Penins. Selangor Coast: Carey Island.—Singapore Island: Kranji, 6.2.1923; Mandai, March, 1923 (H. C. Abraham coll.)

Recorded from Sumatra, Banka, Billiton and Borneo.

41. **E. semipurpurea** Burm.

Malay Penins. Selangor: Kuala Lumpur, from February to September, coll. at light; Kuala Tahan: Wray's Camp, November, 1920 (J. Bangga coll.)—Perak: Batang Padang: Jor Camp, February—March, 1915, at light.

Described from Sumatra.

42. **E. sinica** Arr.?

3 ♀. Penins. Siam: Patalung: Paknam Lampan, 13.4.1924, at light (I. H. N. Evans coll.)—Trang: Banchong, 20.4.24, at light; Banzai Pap. 23.4.24.

Described from S. China.

43. **E. tetanotricha** Ohs.

Malay Penins. W. Coast: Langkawi Isld. 20.4.1928, 1 ♀. (H. M. Pendlebury coll.)

Described from Sumatra.

44. **E. viridis** F.

Java: Preanger (H. M. Pendlebury coll.)

v. **jurinei** McLeay. *ibid.*

v. **nigra** Nonfr. *ibid.*

The species is described and known only from Java and recorded as dangerous to cultivated plants in the larval stage.

45. **Adoretosoma chinense** Redtenb.

Malay Penins. Pahang: Fraser's Hill, 4,200 ft. 26.5.1926 (H. M. Pendlebury coll.); Cameron Highlands, 4,000–4,800 feet, 27.5.31.

Described from Southern China.

46. **Mimela (sens. strict.) debilis** Sharp.

Malay Penins. Selangor: Bukit Kutu, 3,500 ft. 15.4.–9.9., at light (H. M. Pendlebury coll.) Perak: Kedah Peak, 3,300 feet 23.3.28; The Gap, 2,700 feet, March, 1921.—Singapore, March, 1923.—W. Coast: Sembilan Islands, Pulau Rumpia, 6.3.1926, at light (E. Seimund coll.)—Pahang: Lubok Tamang, 3,500 ft. 7–11.5.1923; Fraser's Hill, 4,000 ft. 31.1.1929; Cameron Highlands, 4,800 ft. 24. 1.—19.10.1923, all coll. at light by H. M. Pendlebury.

Described from Sumatra and known from Perak, Java and Borneo.

47. **M. discoidea** Burm. **forma typica.**

Malay Penins. Kedah Peak, 3,300 ft. 9–27.3.1928.—Pahang: Gunong Tahan, 5,500 ft. 8.1.23; Sungei Ringlet, 3,500 ft. 13–14.3.1925; Lubok Tamang, 3.500 ft. 11.6.23.—W. Coast: Langkawi Island 21.4.1928.—Penins. Siam: Nakon Sri Tamarat: Khao Luang, 750–2,000 ft. 1.3–1.4.1922, all collected at light by H. M. Pendlebury. Java: Tjibodas, May, 1916, collected by H. C. Robinson.

M. discoidea Burm. subsp. **sumatrana** Ohs. (Upper surface without dark markings).

Perak: Batang Padang: Jor Camp, 1,800 feet. 17.3.–5.6. 1923; The Gap, March, 1921, at light.

Common in Java and Sumatra.

48. **M. lissoptera** Ohs. sp. n. (see page 140).*

Malay Penins. Perak: Larut Hills 3,700 ft. 7–15.2.32., at light, (H. M. Pendlebury coll.) ♂ ♀.

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*Dr. Ohaus has re-examined some specimens that had been referred with doubt to *M. debilis;* all were found to belong to his *M. lissoptera.* This species, therefore, has a much wider range than that indicated above, and occurs on all hills, except Kedah Peak, with *M debilis.*
H. M. P.

49. **M. lutea** Ohs.

Penins. Siam: Nakon Sri Tamarat: Khao Luang, 750 ft. 22.2.1922. Pahang: Lubok Tamang, 3,500 ft. 12.6.1923, at light (H. M. Pendlebury coll.)

Described from Perak, Kuala Kangsar.

50. **M. signaticollis** Ohs.

Malay Penins. Kedah Peak, 2,500–3,000 ft. 23.3.1928 (H. M. Pendlebury coll.)

Described from Indo-China.

51. **M. viriditestacea** Ohs. sp. n. (see page 141).

Penins. Siam: Nakon Sri Tamarat: Khao Luang, 2,000–2,500 ft. 19–27.3.1922, at light (H. M. Pendlebury coll.)

52. **M.** (subgen. **Eriomela**) **chrysoprasa** Hope.

Malay Penins. Perak (C. Wray coll.) Penins. Siam: Nakon Sri Tamarat: Khao Luang, 2,000 ft. 2–3.4.1922, at light (H. M. Pendlebury coll.)

Known from ? Thibet, Malaya, Nias, Sumatra, Borneo.

53. **Er. inscripta** Nonfr.

Malay Penins. Perak, (ex coll. Perak Mus.) (C. Wray coll.) —Pahang: Pekan (ex coll. Agric. Dept.) Ulu Sungei Triang, June, 1930 (D. S. Inglis coll.).

Described from Siam, but found also in Bengal, Burma, Tonkin. Ten specimens, two of them deep blood-red with whitish yellow sides of the pronotum.

54. **Er. klossi** Ohs. sp. n. (see page 142).

Malay Penins. Cameron Highlands, Tanah Rata, 4,800 ft. 14.6.23–1.9.23, at light (H. M. Pendlebury coll.) Same locality, Bukit Lindong 5,000 ft. 21.5.31. Pahang: Gunong Benom, 6,000 ft. 31.8.25 (I. H. N. Evans coll.)

55. **Macropopillia arrowi** Ohs.

Malay Penins. Selangor: Kuala Lumpur, 1.10.1923; at light (H. M. Pendlebury coll.)

56. **Popillia biguttata** Wied.

Java: Preanger: Papandajan, 5,500 ft. 22.4.23; Tjisoeroepan, 4,200 ft. 24.4.23, at light (H. M. Pendlebury coll.)

57. **P. mongolica** Arr.

Penins. Siam: Koh Si Chang, December, 1914 (C. Boden Kloss coll.)

58. **P. sandyx** Newn.

Malay Penins. Selangor: Ulu Gombak, 5.1.30 (H. M. Pendlebury coll.)

P. sandyx var. **foveolata** Sharp.

Perak: Jor Camp, 2,000 ft. 23.8.1922, Kuala Lumpur: Gombak Valley, 26.12.1930 (H. M. Pendlebury coll.)

Very common in Sumatra, Malay Peninsula and Borneo.

There is also in the collection a unique female specimen of a *Spilopopillia* species, probably new, but it is left undetermined pending the discovery of the male. (Malay Penins. Perak: Larut Hills 4,500 ft., 23.2.32, H. M. Pendlebury coll.).

III. Tribus *ADORETINI*.

59. **Adoretus (sensu stricto) malaccanus** Ohs. sp. n. (see page 143).

Malay Penins. Kuala Lumpur, February, 1919; Blackwater Estate: Klang, June, 1916 (C. B. Holman-Hunt coll.).

60. **Ad.** (subgen. **Chaetadoretus**) **borneensis Krtz.**

Malay Penins. Selangor: Kuala Lumpur. 8.1–19.10 (H. M. Pendlebury coll.) Blackwater Estate, Klang, 5–6.1915 (C. B. Holman-Hunt coll.). Perak: Taiping, 15.2.24 (M. R. Henderson); Negri Sembilan, Kuala Pilah, February, Pahang: Kuala Tahan 20.11.21 (H. M. Pendlebury).

61. **Ch. cribratus** White.

Malay Penins. Selangor: Kuala Lumpur, 25.6–10.9. at light (H. M. Pendlebury coll.) Pahang: Lubok Tamang, 3,500 feet, 7.3.24 (H. M. Pendlebury).

Described from South China.

62. **Ad.** (subgen. **Lepadoretus**) **compressus** Web.

Malay Penins. Selangor: Kuala Lumpur, 15.6–17.10; Blackwater Estate, Klang, 30.5; Setapak, 20.8. Carey Isld. 2.2.—Pahang: Pekan, June.—West Coast: Langkawi Isld. 14.4—20.8, at light (H. M. Pendlebury coll.). The species is probably a native of the Malay Peninsula and Sumatra, and widely distributed with cultivation plants.

Of these 62 species of the subfamily *Rutelinae*, five, viz. *Aprosterna antiqua* Gyll., *Anomala obsoleta* Blanch., *Euchlora cupripes* Hope, *Euchlora viridis* F. and *Lepadoretus compressus* Web., have been recorded as dangerous to cultivation, and it is known that they can be transported in their early stages with plants. Perhaps also *Parastasia bimaculata* Guer. and *confluens* Westw., living in the grub stage in coconut trees, *Aprosterna pallida* F., living in that stage on plants-roots owe their wide distribution to such transport. Seven species, *Anomala brevidens* Ohs., *lasiocaula* Ohs., *sinica* Arr., *Adoretosoma chinense* Redt., *Mimela signaticollis* Ohs., *Popillia mongolica* Arr., *Adoretus cribratus* White, described from the adjacent north-eastern region, Siam, Indo-China and South China, occur also in the Malay Peninsula, while most of the remainder are common to Malaya and South Eastern islands, Sumatra, Java and Borneo. Only ten species, *Parastasia klossi* Ohs., *Anomala aureola* Hope, *holomelaena* H. Bts., *pendleburyi* Ohs., *Spilota malaya* Ohs., *Mimela lissoptera* Ohs., *lutea* Ohs., *viriditestacea* Ohs., *klossi* Ohs., *Adoretus malaccanus* Ohs., seem to be indigenous to Malaya, and this number compared with that of indigenous *Rutelinae* of Siam and Indo-China, Burma and the Malayan islands, being not very great probably will be increased, especially in the subgenus *Anomala* (sens. strict.), when the higher regions of the mountains have been further explored.

Descriptions of the New Species.

Anomala pendleburyi sp. n. (Fig. 1.)

Closely related to *A. windrathi* Nonfr. Uniform dark coppery or partly metallic green, somewhat shining. Head, pronotum, scutellum, tibiae and tarsi coppery, elytra, body beneath and femora metallic green. Body stout, convex, ovate, the tip of pygidium, the metasternum and legs with some scattered hair. The clypeus is broad, subrectangular with the margin gently reflexed, densely rugosely sculptured, whil the head is more singly punctured. The pronotum is narrowed in front, the anterior angles rectangular and somewhat prominent, the posterior ones subrectangular and gently rounded, the basal margin interrupted only before the scutellum, the disk somewhat strongly but singly punctured, more strongly and confluently at the sides. Scutellum punctured like the disk of the pronotum. Elytra deeply striated, all primary costae convex, the subsutural interval bearing two broad secondary costae and between them a small tertiary one, not quite reaching the hind border; the second and third intervals with two regular convex secondary costae, while at the sides the intervals are flattened; the punctures in the striae are regular and more or less annular. Pygidium very densely and finely rugulose, opaque with some few hairs at the tip. Body beneath shining, with scattered annular punctures at the ventral segments, while the metasternum is densely confluently punctured and clothed with grey-yellowish hair. The mesosternum is not produced, the front tibiae bidentate and the larger claw of the front and middle leg is cleft.

♂. Antennal club somewhat longer in the ♀; terminal tooth of the front tibia short and acute, inner claw of the front tarsi not much thickened. Form of the aedeagus see fig. 1.

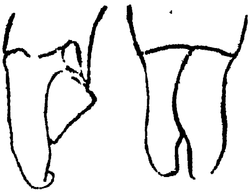

Fig. 1. *Anomala pendleburyi* sp. n.

♀. Terminal tooth of the front tibia long and broadly rounded. Length 19–21, breadth 10½–11½ mm. Malay Peninsula: Kedah Peak, 3,300 ft. 12–21.3.1928; Selangor: Bukit Kutu, 20.4.1926 (H. M. Pendlebury coll.)

A. (Spilota) malaya sp. n.

Next allied to *Sp. moultoni* Ohs., ovate, somewhat flattened above, chestnut brown with a faint coppery lustre, very brilliant, the legs and antennae sometimes yellowish-brown. The clypeus and forehead are densely and rugosely, the vertex very sparsely and finely, punctured. The pronotum is highly polished, showing only at the sides some fine punctures, while the usual lateral fovea generally is doubled; the lateral margins, largest at the base, are strongly narrowed to the front, the front angles acute and somewhat projecting, the basal margin interrupted only before the midst of the scutellum, which is scarcely punctured. The elytra bear the usual rows of fine punctures, evanescent near the base and finely impressed only near the apical margin. Pygidium finely and sparsely punctured with a few setae at the apex. Metasternum smooth in the middle and dispersely punctured at the sides with some few fine setae near anterior border, the mesosternal process is very strong, curved, bluntly pointed and compressed. Front tibia bidentate, the apical tooth in the ♂ short and sharp, in ♀ longer, large and bluntly rounded. The form of the aedeagus is similar to that of *Sp. moultoni* and *drescheri*. Length 19, breadth 10½–11 mm. ♂ ♀. Malay Peninsula. Selangor: Bukit Kutu. 3,500 ft. 14–20.4.1926 (H. M. Pendlebury coll.)—Perak, ex coll. Perak Museum (C. Wray coll.)

Mimela lissoptera sp. n. (Fig. 2.).

Nearest allied to *M. debilis* Sharp, very similar in shape and coloration, but somewhat more slender and distinguished especially by the parabolic (not trapezoidal) clypeus, and planed elytra. Oblong-ovate, somewhat convex, upperside brilliant straw-coloured without any trace of metallic tinge even at the borders; underside, legs (except the yellowish femora) and pygidium reddish-brown; upperside bare, pygidium, abdomen and legs sparsely, metasternum densely clothed with fine greyish hair. In the clypeus the angles are so much rounded in both sexes that it appears parabolic; this surface like that of the forehead is densely confluently punctured, while the vertex bears smaller single points. Prothorax somewhat coarsely punctured, densely here and there, confluently at the sides, finer and more singly on the disk. In the elytra the rows of punctures limiting the primary costae are regular, but these punctures are mostly singly impressed, furrowed only beside the apical callus, not at all on the disk and the sides. Pygidium brilliant, very coarsely wrinkled in both sexes. Underside with great annular punctures, confluent at the sides. In the aedeagus, fig. 2, the paramera seen from the left side are scarcely rounded at the tip and finely toothed at the lower basal edge.

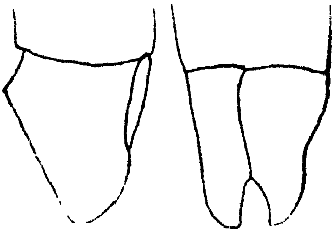

Fig. 2. *Mimela lissoptera* sp. n.

Long. 12–13, lat. 7–7½ mm. ♂ ♀. Perak: Larut Hills, 3,700 feet, 7–15 February 1932, at light, (H.M. Pendlebury coll.).

Mimela viriditestacea sp. n.

Upper side and pygidium bright metallic green, very brilliant, the lower surface and legs testaceous with a very faint metallic green and coppery lustre. Body ovate, convex. Clypeus broad with the sides nearly parallel, the margin somewhat elevated, the surface densely and confluently but not coarsely punctured; forehead somewhat impressed and finely rugose, vertex with fine single punctures. Pronotum more than twice as broad as long with the sides strongly rounded, the anterior angles acute and projecting, the hind angles obtuse but not rounded, the surface closely but not confluently punctured, the lateral foveae strongly impressed. Scutellum very finely and sparsely punctured. Elytra with regular rows of very fine shallow punctures, which between the suture and the apical callus are shortly sulcate; at the sides near the hind angles the punctures are stronger and the rows more sulcate and the membranous border is here broadened. Pygidium singly punctured with long hair at the sides and apex. Abdominal sternites smooth with very faint single punctures and the ordinary transverse row of piliferous punctures. Hind coxae and metasternum at the sides densely confluently punctured, the punctures bearing fine yellow hair, metasternum in the middle impressed, very brilliant; mesosternum without any projecting process. The legs are somewhat slender and the terminal tooth of the front tibia (in the ♀) is long and blunt.

Length 14½–16, breadth 8½–9 mm. 5 ♀, ♂ unknown. Peninsular Siam: Nakon Sri Tamarat: Khao Luang, 2,000–2,500 ft. 23–30.3.1922 (H. M. Pendlebury coll.)

The species is allied to *M. heterochropus* Blanch., which has quite a different sculpture of the pronotum and elytra, the under surface more reddish with darker hind tibiae and stouter legs.

Mimela (Eriomela) klossi sp. n. (Fig. 3.).

Oblong-ovate, convex, somewhat broadened behind, upper surface and pygidium dark olivaceous green, not much shining, under surface and legs metallic green with copper lights, the femora of all legs brownish translucent. The clypeus is twice as broad as long, parallel-sided, with the margin somewhat thickened but not elevated; head and pronotum densely and confluently, somewhat finely, punctured, the anterior angles of the pronotum acute and produced, the hind angles nearly rectangular and somewhat rounded; lateral foveae and basal margin wanting. Scutellum with some few very fine punctures near the base. Elytra without any trace of striae or rows of punctures except along the suture and sides, very finely and sparsely punctured. Pygidium flat, not shining, densely rugosely punctured with long greyish hair at the apex and the sides. The sternites and metasternum in the midst are densely but singly, at the sides confluently and rugosely punctured with appressed greyish hair especially along the border of the elytra. The mesosternal process is acute, but short, scarcely extending beyond the middle coxae. The legs are long and slender, with erect long greyish setae; on the front tibiae the terminal tooth in the ♀ is long and blunt, the basal tooth very feeble. Palpi and antennae yellowish with a short dark green club. The form of the aedeagus shown in figure 3. Length 18½–21, breadth 10½–11 mm. 1 ♂, 6 ♀. Pahang: Cameron Highlands, Camp No. 4, 4,800 ft. 14.6–1.10.1923 (H. M. Pendlebury coll.); ♂ same locality, 5,000 ft. 21.5.31. ♀ Gunong Benom, 6,000 ft. 31.8.25 (I. H. N. Evans coll.)

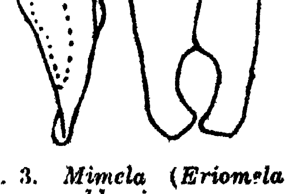

Fig. 3. *Mimela (Eriomela) klossi* sp. n.

The species is next allied to *E. passerinii* Hope and *oblonga* Arr., but is distinguished by its slender form, the dark olivaceous green colour and the fine sculpture of the elytra.

Adoretus malaccanus sp. n. (Fig. 4.).

Tawny yellow above and beneath, with the legs bright yellow and the tarsi darker. Body elongate-oval in shape and rather shining, sparsely clothed with short fine hair. The head is long and large, the clypeus parabolic with elevated margin, transversely rugose and clothed with whitish recumbent setae, more densely set along the eyes and the elevated border of the clypeus. The pronotum is covered with annular punctures, short and convex, the front angles nearly rectangular and the hind angles rounded. Scutellum finely rugose with smooth apex. The elytra have six elevated costae, marked by fine furrows, the interstices are irregularly punctured. Pygidium and abdomen densely and finely rugose, covered with appressed hair. The legs are stout, the front tibia is armed with three equidistant teeth and the larger claw of all feet is simple in both sexes. ♂ The clypeus is longer with the margin more elevated; the eyes very great and prominent, the pronotum more flattened and more densely rugose, the antennal club as long as stem. The form of the aedeagus shown in fig. 4.

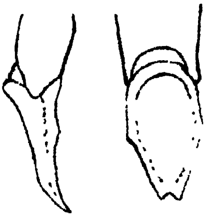

Fig. 1. *Adoretus malaccanus* sp. n

♀. The pronotum is more convex, less densely and more coarsely punctured.

Length 10½, breadth 5–5½ mm. ♂ ♀. Malay Peninsula: Kuala Lumpur, February, 1919, Blackwater Coast: Klang, June, 1916 (C. B. Holman Hunt coll.)

The species bears some resemblance to *A. birmanus* Arr., but the head is larger with the border more elevated, the eyes of the ♂ are much more prominent, and the convex costae limited at the sides by deep regular furrows.

VII. A NEW SPECIES OF *TRACHYS* FROM BORNEO.
(Coleopt. Buprestidae).

By W. S. FISHER.

Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

In identifying a small collection of Buprestidae collected by Mr. H. M. Pendlebury on Mt. Kinabalu, British North Borneo, the following new species was found.

Mr. Pendlebury writes that the Buprestid fauna of Mt. Kinabalu was very disappointing: in fact all timber-boring beetles were extremely scarce, which he thinks is probably due to the fact that nearly all of the heavy jungle below 3,500 feet has been cleared for cultivation, and much of the jungle above that altitude is sodden and kept continually moist by mists and rain.

My sincere thanks are extended to Mr. H. M. Pendlebury for the privilege of studying this interesting collection of Buprestidae, and also to Mr. C. Boden Kloss, Director of Museums, Straits Settlements and Federated Malay States, for his kindness in permitting me to deposit the type of the new species in the United States National Museum Collection, at Washington.

Trachys kinabalensis sp. n.

Broadly cuneiform, rather strongly convex, strongly expanded anteriorly, and widest at base of pronotum; above black, moderately shining, with a more or less distinct aeneous, greenish, or violaceous tinge in certain lights, rather densely, irregularly clothed with reddish-brown and pale yellow pubescence, and each elytron ornamented with a narrow, transversely arcuate, pale yellow pubescent fascia at apical third; beneath aeneous, and strongly shining.

Head with the front broadly, feebly concave between the eyes, with a vague, narrow, median groove extending from the occiput to a broad, vague depression behind the epistoma, and without distinct postoral pores; surface sparsely, vaguely, ocellate-punctate, and sparsely, irregularly clothed with long, recumbent, reddish-brown and pale yellow pubescence intermixed; eyes not very strongly margined on inner sides, but rather strongly converging toward bottom of head; epistoma feebly elevated, very short, twice as wide as long, the surface transversely depressed, and vaguely, transversely striate, and the anterior margin transversely truncate, with the exterior angles strongly produced; clypeal suture distinct.

Pronotum three times as wide as long at middle, much narrower at apex than at base, and widest at base; sides strongly, arcuately narrowed from base to apical angles, which are acute, and extending forward on a line with the middle of the eyes; posterior angles acute, and feebly produced backward; anterior margin semicircularly emarginate; base strongly, transversely sinuate, with the median lobe broadly rounded, and strongly produced; disk feebly convex, and broadly, but not deeply at the sides; surface rather densely, feebly, irregularly ocellate-punctate, and rather densely, irregularly clothed with long, recumbent, reddish-brown and yellow pubescence intermixed, but not forming any distinct designs. Scutellum small, and triangular.

Elytra widest at base and subequal in width to the pronotum at base; sides strongly, obliquely narrowed from base to near the tips, which are conjointly, broadly rounded; humeri prominent and strongly elevated; each elytron with a feebly elevated lateral carina extending from humeral angle to near the apex, with a broad, shallow, basal depression, and a deeper depression along the lateral margin behind the humerus; surface finely, rather densely, irregularly punctate, more or less finely rugose, rather densely, irregularly clothed with long, recumbent, reddish-brown and pale yellow pubescence intermixed, and each elytron ornamented with a narrow, transversely arcuate, pale yellow pubescent fascia at apical third, the fascia not extending to the sutural margin.

Beneath strongly convex; abdomen finely, vaguely granulose, densely ocellate-punctate, the ocelli open posteriorly, and sparsely clothed with short, recumbent inconspicuous, white hairs. Prosternum slightly declivous anteriorly, the anterior margin broadly rounded, but not distinctly margined; prosternal process strongly elevated, vaguely wider than long, slightly narrower in front than behind, and the sides obliquely expanded to the apex, which is broadly, vaguely rounded. Tarsi black, and the tarsal lamellae whitish.

Length, 4 millimeters; width, 2.6 millimeters.

Type locality.—Mt. Kinabalu, British North Borneo.

Type.—United States National Museum, Washington.

Described from a unique example collected at Marei Parei (5,000 feet elevation), Mt. Kinabalu, British North Borneo, April 28, 1929, by H. M. Pendlebury.

This species is allied to *singaporensis* Obenb., but it differs from that species in having the front of the head feebly concave between the eyes, which are not strongly margined on the inner sides, head without distinct postoral pores, the pubescence more reddish-brown and not forming distinct designs on the basal halves of the elytra.

VIII. DIE LYCIDENFAUNA DER GEBIRGE BORNEOS.

(Zugleich ein Bericht über die Ausbeute die Herr H. M. Pendlebury aus dem Kina-Balu-Gebirge mitgebracht hat.)

Von R. KLEINE—*Stettin.*

(Abb. 1–53.)

*Die Lycidenfauna der Sunda-Inseln und der Malayischen Halbinsel ist sehr einheitlich. Das gilt allerdings nur für die Gattungen, denn die Arten haben meist eine geringe Verbreitung, grosse Migration ist selten.

So einheitlich der Habitus ist, so scharf umschrieben ist auch die Ausfärbung. Der Unterkörper und die Extremitäten sind von dunkler Farbe. Dunkelbraun herrscht vor, Verdunkelung bis schwarzbraun kommt oft vor, auch metallische Farben finden sich, Aufhellung ist seltener. Dem gegenäber sind Prothorax, Schildchen und Elytren meist hell gefärbt. Einfarbige schwarze Arten sind selten, finden sich eigentlich nur in der Malayischen Halbinsel öfter und nur vereinzelt ist grössere Neigung zu Migration festzustellen. Die hellen Farben der Körperoberseite wechseln von helllehmgelb über orange, ziegelrot, carmin, blutrot einerseits und hellbraun andrerseits. Arten mit ganz einfarbiger Körperoberseite sind nicht in der Ueberzahl. Manchmal sind Prothorax und Schildchen von der Farbe der übrigen Körperteile, also dunkel; die Elytren sind meist nicht ein- sondern zweifarbig. Ist das der Fall, so ist die helle Grundfarbe durch eine dunkele, der Körperfarbe entsprechende, Partie abgesetzt. Diese Dunkelpartie liegt, und das ist das Ausschlaggebende, immer am Hinterrand, niemals an der Basis. Die Intensität und Ausdehnung sind verschieden. Der dunkle Teil kann nur als schmaler, unscharfer Schatten am Hinterrand liegen, aber auch so ausgedehnt sein, dass nur noch das basale Drittel hellfarbig bleibt.

Diese Anlage der Elytrenfärbung ist keineswegs ein Charakteristikum der orientalischen Region, im Gegenteil. In der aethiopischen Region bildet sie die Regel, anders gefärbte Arten sind Ausnahmen. Auch in anderen Regionen findet man das Zeichnungsschema wieder, wenn auch nicht so exklusiv. Es kann also keinem Zweifel unterliegen, dass hier ein grundlegendes Zeichnungsmerkmal der ganzen

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*Mr. N. C. E. Miller, Department of Agriculture, F.M.S. and S.S., has kindly given the following translation for the introduction:—

The Lycid fauna of the Sunda Is. and of the Malay Peninsula is very uniform. That of course, applies only to the genera, for the species have mostly a restricted distribution, great migration being rare.

As the facies is uniform, so is the coloration sharply limited. The ventral surface of the body and the extremities are of a dark colour. Dark brown prevails,

Familie vorliegt. Dieser Zeichnungscharakter findet sich in der Ebene und im Hügelland allgemein, ich sah ihn bis in Höhen von wenigstens 1,000 m ohne dass sich andere Zeichnungselemente dazwischen gedrängt hätten.

Da erhielt ich von Herrn Dr. E. Mjöberg vor einigen Jahren, als er noch am Sarawak-Museum tätig war, eine Ausbeute Lyciden die er von einer Reise den Gebirgen N.—W.—Borneos mitgebracht hatte. Darunter befanden sich einige ganz auffalende Tiere, die vom Mt. Dulit, also aus Höhen von mehr als 1,400 m stammten. Es waren 3 Arten aus 3 Gattungen, nämlich: *Xylobanus*, *Cautires* und *Metanoeus*. Alle zeichneten sich zunächst durch eine grosse Brillanz der Farben aus. Die dunkelbraunen Körperteile hatten sich zu einem tiefen, meist matten, Russschwarz entwickelt, helle, orange oder ziegelrote Töne waren feuriger als im Tieflande. Diese Erscheinung ist an sich nichts besonderes, denn man kann dasselbe auch von höher gelegene Fundorten Sumatras und Javas feststellen, aber, und das ist das wichtigste, die Farbenverteilung auf der Oberseite des Körpers war eine gänzlich andere wie bei Arten aus dem Tief—und Hügellande. Die Farbenverteilung ist folgende: Prothorax und Schildchen sind genau so tiefschwarz wie der Körper selbst, die Elytren sind gleichfalls so gefärbt, aber sie sind nicht nur am Hinterrand schwarz, sondern auch der Basalteil ist in mehr oder weniger grossem Umfang schwarz, sodass nur eine hell gefärbte Querbinde übrigbleibt. Diese Binde kann von wechselnder Ausdehnung und Anlage sein, aber sie ist immer vorhanden und gibt dem Tier sofort ein auffälliges Ansehen. Man erkennt sofort, dass hier eine ganz andere Anlage der Zeichnungselemente vorliegt.

Man könnte das Auftreten solch abweichender Zeichnungen für Zufall, Ausnahme oder Störung halten. Hätte nur eine Art oder doch nur eine Gattung vorgelegen, so hätte ich keine weitere Notiz davon genommen. Da sich die merkwürdige Erscheinung aber zugleich in 3 verschiedenen Gattungen wiederfand, wurde ich doch aufmerksam.

Einige Jahre darauf hat Herr Dr. Mjöberg die Gebirge S.—O.—Borneos bereist und namentlich auf dem Mt. Tibang in 14–1,700 m Höhe schöne Lyciden erbeutet. Seine Ausbeute ist damals in meinen Besitz übergegangen und ich habe das interessante Material bearbeitet.[1] Bei der

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[1] Stett. Ent. Zeit. 89, 1928, p. 313–332, 1 Doppeltaf.

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darkening to blackishbrown is frequent, and metallic colours are present also. Paleness is more rare. In opposition to this, the prothorax, scutellum and elytra are mostly of a pale colour. Unicolorous black species are rare and are more often found solely in Malaya, and only in isolated cases is a propensity to spread established. The pale colours of the dorsal surface of the body vary from luteous to orange, brick red, carmine, sanguineous on the one hand, and light brown on the other hand. Species with a completely unicolorous dorsal surface are not in

Aufarbeitung fand ich nun, dass sich unter den Arten von Mt. Tibang das gleiche Zeichnungsschema wiederfand wie auf dem Mt. Dulit. Die Gesamtausbeute betrug 82 Individuen, die sich auf 17 Gattungen und 38 Arten verteilte, 19 davon waren von Mt. Tibang. Von diesen 19 hatten 8 die gleiche Zeichnung wie die Tiere vom Mt. Dulit. Die 8 Arten gehörten 8 verschiedenen Gattungen an. In tieferen Lagen als 1,400 m wurden keine gebänderten Arten mehr gefunden.

Nun hat Herr H. M. Pendlebury die höheren Lagen des Kina-Balu exploriert und in Höhen von 3,300′–7,200′ gesammelt. Das Material, nur klein in Umfang und Individuenzahl, hat soviel neues und interessantes gebracht, dass ich mir wohl über die Fauna der Berge Borneos einige Worte erlauben durfte. Von den 37 Arten, die Herr Pendlebury mitgebracht hat, scheiden 4, die im Hügelland gesammelt sind, von vorneherein aus, 12 sind nach dem Höhentypus gezeichnet, haben also gebänderte Elytren. Von diesen sind 9 Arten neu.

Von den Gebirgen Borneos sind demnach mit gebänderten Elytren bekannt: Vom Mt. Dulit 3 Arten

„ Mt. Tibang 8 „

„ Mt. Kina-Balu 9 „

zus. 20 Arten.

Die an mehreren Lokalitäten gefundenen Arten sind natürlich nur einmal aufgeführt worden. Die Verteilung auf die einzelnen Gattungen ist folgende:

1. *Lycostomus xanthomelas* Kln.
2. *Cladophorus monticola* Kln.
3. „ *nigropallidus* Kln.
4. *Xylobanus assimilis* Kln.
5. „ *cognatus* Kln.
6. „ *contrarius* sp. n.
7. „ *pendleburyi* sp. n.
8. *Bulenides duplicatus* Kln.
9. „ *flavoreticulatus* sp. n.
10. *Cautires asper* Kln.
11. „ *thoracicus* sp. n.
12. „ *bicoloratus* sp. n.

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the majority. Frequently the prothorax and scutellum are of a dark colour as the rest of the body; the elytra are mostly not of one but of two colours.

When such is the case, the pale ground colour is demarcated by a dark area agreeing with the body colour. This dark area lies always along the hind border, never at the base. The intensity and extent vary. The dark area may only be present as a narrow indefinite suffusion on the hind margin, but also may be so extended that only the basal third remains pale coloured. On the contrary, this arrangement of the colour of the elytra is by no means characteristic of the Oriental region. In the Ethiopian region this is the rule, species coloured otherwise being exceptions. In other regions also one finds the scheme again, even if not so exclusively.

13. „ *asperoides* sp. n.
14. „ *kinabalensis* sp. n.
15. *Metanoeus montanus* sp. n.
16. „ *flavofasciatus* Kln.
17. „ *pendleburyi* sp. n.
18. *Melampyrus diversesignatus* Kln.
19. *Calochromus basipennis* Pic.
20. „ *rubrofasciatus* Kln.

Es kann keinem Zweifel unterliegen, dass hier eine ganz bestimmte Correlation zwischen Höhenlage und Farbenanordnung vorliegt. Gewiss finden sich auch Arten aus den tieferen Lagen, aber sie treten doch zurück. Einmal tritt auffällige Vertiefung oder Brillanz der Farben ein und dann ist auch eine nicht abzuleugnende Tendenz zur Farbenumlegung vorhanden. So kommen Arten vor, die die schwarze Zeichnung auf den Elytren nur an der Basis haben, und dann ein zweiter Typ, der dadurch charakterisiert ist, dass die hellen Farben auf den Elytren sich nach dem schwarzen Hinterrand weiter ganz auffällig aufhellen. Das alles sind Eigentümlichkeiten in der Ausfärbung, die man nur in Gebirgslagen feststellen kann.

Wenn das gesamte Material nur vom Kina-Balu stammte könnte man annehmen, dass es sich um eine lokale Erscheinung handelt. Ich habe zwei Mjöberg'sche Arten vom Mt. Dulit auch tatsächlich auf dem Mt. Kina-Balu wiedergefunden. Aber die Tatsache, dass auch in S.—O.—Borneo dieselben Färbungen vorkommen, gibt doch zu denken und fordert unsere Aufmerksamkeit zu weiteren Studien heraus.

Die neuen Arten sind nachstehend beschrieben worden. Alle sind, mit einer Ausnahme, von H. M. Pendlebury gesammelt worden. Die Typen befinden sich sämtlich im F.—M.—S.—Museum zu Kuala Lumpur. Cotypen, soweit sie vorhanden waren, sind in meiner Sammlung. Von schon bekannten Arten wurden noch aufgefunden.

1. *Cautires pauperulus* Bourg. Kiau 3,000′. Das Belegstück ist sehr gross und gehört zu den aufgehellten Formen. Der Prothorax ist nur noch zum Teil hellbraun, die helle Partie der Elytren hat keinen dunklen Grund mehr. Der Einfluss des Gebirges macht sich bemerkbar.
2. *Cautires asper* Kln. Kenokok, 3,300′ 22.4.29. Gebirgsart die schon aus der Mjöberg'schen Ausbeute vom Mt. Dulit beschrieben worden ist.
3. *Cautires cognatus* Bourg. Kenokok 3,300′ 22.4.29.

There can be no doubt that here a fundamental distinguishing mark of the whole family is established. This distinguishing character is found commonly in the plains and hill country. I observed it at altitudes of at least 1,000 m. without other distinguishing factors appearing along with it.

Some years ago, I received from Dr. E. Mjöberg when he was then working at the Sarawak Museum, a collection of Lycidae which he brought back after a journey in the mountains of north-west Borneo. In this were some quite excep-

4. *Lycostomus gestroi* Bourg. Kiau 3,000′ 23.3.29.
5. *Dilophotes pulchellus* Kln. Lumu-Lumu, 5,500′. 12.4.29.
6. *Lyropaeus optabilis* Kln. Gleicher Fundort. 14.4.29.
7. *Calochromus nigromarginatus* Bourg. Kiau 3,000′. 23.3.29. Diese Art ist auch in tieferen Lagen (Kabayau 600′) festgestellt.
8. *Calochromus basipennis* Pic. Nach einer Zeichnung die mir der Autor früher zur Verfügung gestellt hatte, musste es sich um eine Gebirgsart handeln. Nun hat Herr Pendlebury die Art tatsächlich aufgefunden: Lumu-Lumu 5,500′.

Von den 8 Arten sind also noch 2 reine Gebirgstiere. Es ist auffällig, wie wenig Arten aus dem Tieflande ins Gebirge gegangen sind. Von den restlichen 6 scheiden auch noch einige für das Tiefland aus und gehören mehr dem Hügellande an.

Beschreibung der neuen Arten.

1. **Cautires kinabalensis** sp. n. (Abb. 1–3).

Schwarz, glänzend, auf den Elytren sind Rippen und Gitterung bis in die feinsten Teile lehmgelb behaart während der Grund schwarz bleibt, Basis und Spitze sind ganz schwarz.—Stirn breit aber flach eingedrückt, Fuhlerbeulen robust, ohne deutliche Mittelfurche.—Lamellen der mittleren Fühlerglieder beim Mann doppelt so lang als das Glied selbbst. nach vorn werden die Lamellen schlanker und die Glieder kürzer, am 10. sind Glied und Lamelle etwa gleichlang; weibliche Fühler tief gezahnt.—Schildchen länger als breit, zungenförmig, tief eingebuchtet.—Elytren mit sehr deutlicher Gitterung von grosser Variation (Extreme Abb. 1 und 2).

Länge: 10–13 mm, Breite (hum.): 3 mm.

Kina-Balu. Lumu-Lumu 5,500′. 8–18.4.29.

1 ♀, 4 ♂♂.

Die Art gehört zum Gebirgstyp. Die Schwarzfärbung an Basis und Spitze ist massgebend. Auffallend ist die grosse Variationsbreite der Elytrengitterung, die in der Gattung nicht ihres gleichen hat. Eine Verwechslung mit *Xylobanus* ist aber trotzdem nicht gut möglich, da die Rudimente der Sekundärrippen immer nachweisbar sind. Von den bisher beschriebenen Arten ist nur *asper* zu vergleichen der aber keinen dunklen Gitterungsgrund hat und dessen Gitterung regulär 4–5 eckig ist.

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tional examples which originated from Mt. Dulit, also from heights of more than 1,400 m. There were three species or three genera, namely, *Xylobanus*, *Cautires*, and *Metanoeus*, all distinguished particularly by a considerable brilliance in coloration. The dark brown body colour had developed into a deep, mostly dull, sooty black; pale orange, or brick red were more fiery than the lowlands. This phenomenon is in itself not extraordinary for one can observe the same also in elevated localities in Sumatra and Java, but, and this is the most important, the distribution of colour on the dorsal surface of the body was quite of another kind

2. **Cautires asperoides** sp. n. (Abb. 4, ♂; 5, ♀).

Dem *kinabalensis* ähnlich, aber robuster, grösser. Die hellgefärbten Rippen und die Gitterung sind nicht lehmfarbig, sondern blutrot.—Lamellen der Fühlerglieder des Mannes 4–5 mal so lang als das Glied selbst. Die Glieder vom 4. ab vorn gezahnt; nach vorn werden die Glieder schmaler, länger und die Zähnung wird schwächer.—Prothorax breiter als hoch, alle Areolen, auch die seitlichen, die nicht ganz fehlen, deutlich, Randpunktierung tief und gross.—Auf den Elytren ist die Gitterung beim Mann mehr langrechteckig, beim Weib mehr fünfeckig bis quadratisch.

Länge: 13–16 mm. Breite (hum.): 3–3.5 mm.

Kina-Balu: Lumu-Lumu 5,500′. Kamborangah 7,200′, 4.4–17.4.29.–5.29.

1 ♂, 2 ♀♀.

Von *asper* und *kinabalensis* durch den schwarzen Gitterungsgrund und die langen Lamellen der männlichen Fühlerglieder unterschieden. Die Variation ist ähnlich *kinabalensis*.

3. **Cautires bicoloratus** sp. n. (Abb. 6–8).

Schwarz, nur die Elytren mit einer breiten, hellziegelroten Binde ohne dunklen Grund, die an der Basis von einer schmalen, etwa mit dem Schildchen gleichbreiten schwarzen und im Spitzenteil einer ¼ der Elytrenlänge ausmachenden schwarzen Partie unterbrochen wird.—Stirn breit-flach eingedrückt, Fühlerbeulen breit, flach, mit deutlicher Mittelfurche.—Lamellen der Fühlerglieder länger als das Glied selbst.—Prothorax breiter als hoch, Areolen zuweilen rudimentär und nicht mit der discoidalen zusammenhängend, die seitlichen immer getrennt bleibend.—Schildchen länger als breit, zungenförmig, hinten eingebuchtet.—Elytren mit vorherrschend quadratischer, seltener langrechteckiger und nur im hinteren Teil etwas fünfeckiger Gitterung.

Länge: 12.5–16 mm. Breite (hum.): 3.5–4.0 mm.

Kina-Balu: Lumu Lumu 5,500′, Lumu Lumu-Kamborangah 5,000′–7,000′, 30.3.29, 5.–7.4.29.

6 ♀♀.

Die Variation ist gering und erstreckt sich nur auf die Ausdehnung der schwarzen Spitzenpartie. Die prachtvolle, grosse Art ist mit keiner anderen zu verwechseln. *Asper* Kln. hat nur eine schmale helle Elytrenbinde, die Elytrengitterung ist mehr fünfeckig, der Prothorax ist mehr von trapezoider Gestalt und die seitlichen Areolen fehlen ganz. Leider

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from that of species of the low and hill country. The distribution of colour is as follows: Prothorax and scutellum are exactly as deeply black as the body itself, the elytra are similarly coloured, but they are black not only on the hind margin, but the basal area is in more or less greater extent black so that only a pale transverse band remains. This band may be of variable extent, and position, but it is always present and gives the specimen a remarkable appearance. One recognizes at once that here quite another arrangement of distinguishing factors is exhibited. One can consider the appearance of such variable characters as

sah ich keinen ♂ zur Untersuchung. Nach der Grösse der weiblichen Fühlerlamellen müssen dieselben beim ♂ das 4–5 fache des Gliedes selbst betragen. Darin liegt aber ein wesentlicher Unterschied gegen *asper*, wo sie viel kürzer sind.

4. **Cautires thoracicus** sp. n. (Abb. 9–11).

Schwarz, Elytren mit Ausnahme des Hinterrandes und eine schmale basale Partie schmutzig-orange.—Fühler kräftig, Lamellen der mittleren Fühlerglieder 1½–1¾ mal so lang wie das Glied selbst, 11. Glied wenigstens doppelt so lang wie das 10., Behaarung auf allen Gliedern kurz und dicht.—Prothorax (Abb. 9), Hinterrand viel breiter als in der Mitte hoch, alle Ränder, mit Ausnahme der flachen vorderen, stark aufgebogen, Areolen nur schwach entwickelt, die in den Vorderrand gehenden an der discoidalen unterbrochen, seitliche ganz fehlend, Punktierung einzeln aber deutlich.—Schildchen gedrungen, verkehrt-herzförmig, tief eingekerbt.—Elytren mit kräftigen Rippen und gleicher Gitterung.

Länge: 15 mm. Breite (hum.) : 3.5 mm.

Kina-Balu: Lumu Lumu 5,500′, 8.4.29.

1 ♂.

Die Art ist nicht nur unter Formen mit gebänderten Elytren leicht herauszufinden, sie ist durch die bizarre Gestalt von allen *Cautires* leicht zu trennen, da es keine Art mit auch nur ähnlichen verzerrtem Organ gibt. Ein Vergleich mit anderen Arten ist also nicht möglich.

5. **Xylobanus longereticulatus** sp. n. (Abb. 12–14).

Tiefschwarz, nur die Elytren in der basalen Hälfte oder etwas darüber hinaus, Rippen und Gitterung carminrot behaart.—Stirn mit zwei grubigen Vertiefungen. Fühlerbeulen gross, wulstig, Mittelfurche flach.—Prothorax (Abb. 12), Randpunktierung einzeln, gross, kräftig.—Fühler stark entwickelt, 3.–10. Glied in beiden Geschlechtern tief gezahnt, nach vorn nehmen die Glieder an Breite, aber kaum an Länge ab, Behaarung kurz und dicht.—Schildchen verkehrt herzförmig, dreieckig eingekerbt.—Auf den Elytren sind Rippen und Gitterung sehr kräftig entwickelt, auf der Mitte ist die Gitterung auffallend langrechteckig, nach dem Hinterrand zu nimmt sie mehr quadratische Formen an.

Länge: 5.5–9 mm. Breite (hum.:) 1–1.5 mm.

Kina-Balu: Lumu Lumu 5,500′, Kenokok 3,300′.

5 ♂♂, 1 ♀.

'sports,' exceptions, and aberrations. Had only one species, or indeed only one genus been present I would not have remarked further on the matter. Since the remarkable phenomenon appeared again in three different genera I therefore draw attention to it.

A few years after that, Dr. Mjöberg travelled in the mountains of south-east Borneo, namely on Mt. Tibang at an altitude of 1,400–1,700 m, and collected some beautiful Lycidae. His whole collection was handed over to me and I worked out the interesting material. While working them out I found that in the species

Eine nennenswerte Variation war nicht festzustellen. Die Art ist nur mit *fractus* Kln. von Sandakan zu vergleichen. Sie ist leicht durch die lang-rechteckige Gitterung, die bei *fractus* quadratisch, vereinzelt sogar quer ist, zu unterscheiden.

6. Xylobanus pendleburyi sp. n. (Abb. 15–18).

Tiefschwarz, nur die Elytren in den vorden ⅔ ziegelrot, an der Basis in der Region des Schildchens aber schwarz, also schwarz mit breiter ziegelroter Binde.—Fühler gedrungen, mittlere Glieder (Abb. 16), nach vorn nehmen die Glieder an Breite, nicht an Länge ab und die Zähnung wird etwas tiefer.—Prothorax am Hinterrand breiter als in der Mitte hoch, 5 Areolen, von denen die in den Vorderrand mündenden mit der discoidalen nur undeutlich verbunden sind, Punktierung meist kräftig (Abb. 15).—Schildchen verkehrt herzförmig, tief rundlich eingebuchtet.—Elytren mit quer rechteckiger Gitterung, die nur selten eine quadratische Form annommt, Gitterungsgrund hell, nur am Ubergang zur schwarzen Spitzenpartie ist der Grund schwarz, Rippen und Gitterung dagegen noch rot.

Länge: 15 mm. Breite (hum.) : 3 mm.
Kina-Balu: Lumu Lumu 5,500′, 12.4.31.
1 ♀.

Die neue Art steht *assimilis* Kln. vom Mt. Dulit am nächsten. Die Unterschiede sind folgende:

assimilis	*pendleburyi*
Die hellen Farbentöne auf den Elytren sind lehmgelb und nehmen nur ⅓ der Fläche ein. Die Querteilung der beiden Farbenkomplexe ist gerade. Basaler Teil der Schwarzfärbung weit über das Schildchen hinaus ragend. Prothorax so lang wie breit. Elytrengitterung in der hellen Partie quadratisch.	Die helle Partie ist zinnoberrot und nimmt ⅔ der Fläche ein. Die Querteilung ist nicht gerade, sondern nach dem Vorderrand vorgezogen. Schwarzfärbung nur in Ausdehnung des Schildchens. Prothorax breiter als lang, Elytrengitterung quer.

Die zweite Art, die noch zum Vergleich in Frage käme, *cognatus*, hat ganz andere Farbenanordnung auf den Elytren: breite schwarze Binde an der Basis und ganz schmale am Hinterrand.

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from Mt. Tibang the same colour scheme revealed itself as on Mt. Dulit. The collection contained eighty two individuals which were divided among seventeen genera and thirty eight species, nineteen of which were from Mt. Tibang. Of these nineteen, eight had the same characters as those from Mt. Dulit. The eight species belong to eight different genera. At altitudes lower than 1,400 m. no banded species were discovered.

Now Mr. H. M. Pendlebury has explored the higher regions of Mt. Kinabalu and collected at altitudes of 1,150-2,510 m. (3,300′-7,200′). The material though

7. **Xylobanus contrarius** sp. n. (Abb. 19–21).

Schwarz, Elytren mit Ausnahme eines schmalen Streifens an der Basis und am Hinterrande mit blutroter Gitterung und gleichgefärbten Rippen.—Fühler und Prothorax wie bei *pendleburyi,* nur stehen bei letzterem die Himterecken nicht so weit vor und die Gestalt des Organes wird dadurch mehr quadratisch. Auf den Elytren ist die Form der Gitterung nicht so einheitlich querrechteckig wie bei *pendleburyi* sondern wechselt mehr zwischen quadratisch und querrechteckig.

Länge: 14 mm. Breite (hum.): 2.5 mm circa.

Kina-Balu: Lumu Lumu 5,500′, 11.4.29.

1 ♂.

Ein Vergleich mit einer anderen Art ist nicht gut möglich, da *contrarius* die erste ist, deren Elytren an der Basis und am Hinterrande schwarz sind und, wo auf einem dunklen Grunde sich blutrote Gitterung und gleichgefärbte Rippen finden.

8. **Bulenides lyciformis** sp. n. (Abb. 22–24).

Tiefschwarz, nur die Elytren in den vorderen 3/5 orangerot.—Stirn flach, aber breit vertieft, Fühlerbeulen gross, flach, Mittelfurche unscharf, Augen stark vorgequollen.—Fühlerglieder 3–10 mit Lamellen, die vom 7. doppelt so lang als das Glied selbst sind, vom 8.–10. aber kürzer werden.—Prothorax am Hinterrand breiter als in der Mitte hoch, Vorderrand dachförmig abfallend, Vorderecken gerundet, Hinterecken vorgezogen, Mittelkiel kräftig, Areole sehr schmal und unscharf, Randpunktierung obsolet, überall mit feiner Chagrinierung bedeckt.—Schildchen zungenförmig, hinten eingekerbt.—Rippen und Gitterung auf den Elytren kräftig entwickelt, Gitterung im vorderen Teil vorherrschend fünfeckig, sonst quadratisch bis rechteckig, Behaarung kurz.

Länge: 10 mm. Breite (hum.): 2 mm.

Kina-Balu: Kenokok 3,300′, 23.4.29.

1 ♂.

Die neue Art ist mit *cognatus* zu vergleichen. Die Unterschiede sind folgende: Prothorax quer, Elytren nach der Mitte auffällig erweitert. Während *cognatus* von schmaler, schlanker Gestalt ist, ist *lyciformis* eine gedrungene, breite Art. Habituell sind beide Arten ganz verschieden.

small in extent and in individuals has yielded so many new and interesting species that I may indeed permit myself a few words on the fauna of the mountains of Borneo.

Of the thirty seven species which Mr. Pendlebury brought back, four collected in the hill country separate themselves from the foregoing; twelve stand out as types from high altitudes and have also banded elytra. Of these, nine species

9. **Bulenides flavoreticulatus** sp. n. (Abb. 25–27).

Schwarzbraun bis schwarz, nur die Elytren in einem breiten Mittelbande mit gelben Rippen und gleichfarbiger Gitterung.—Stirn breit eingedrückt, Fühlerbeulen breit, flach, ohne merkbare Mittelfurche.—Mittlere Fühlerglieder doppelt so lang als das Glied selbst, nach vorn werden die Lamellen kürzer, vom 10. sind sie kürzer als das Glied.—Prothorax am Hinterrand breiter als in der Mitte hoch, Vorderrand steil abfallend, Vorderecken stumpf, Seiten schwach verengt, Hinterecken stark entwickelt und auffällig vorgezogen, Areole sehr schmal und undeutlich, Punktierung meist grob, gross, tief.—Schildchen verkehrt herzförmig, am Hinterrand tief eingebuchtet.—Elytren mit kräftigen Rippen und gleicher Gitterung die an der Basis, und in grösserer Ausdehnung auch am Hinterrand, noch Sekundärrippen erkennen lässt. Im Durchschnitt ist die Gitterung aber sehr zerrissen und sicher auch variabel, die Anlage der Sekundärrippen ist aber noch deutlich erkennbar.

Länge: 11 mm. Breite (hum.): 2.5 mm.

Kina-Balu: Lumu Lumu 5,500′, 4.29.

2 ♂♂.

Mit keiner anderen Art zu vergleichen oder zu verwechseln. *B. flavoreticulatus* gehört durch die Ausfärbung in die Gruppe der Hochgebirgstiere, Basis und Spitze sind schwarz. In dieser Verwandtschaft ist keine Art mit dunklem Gitterungsgrund und heller Gitterung bekannt. Habituell *Cautires kinabalensis* ähnlich.

10. **Melampyrus giganteus** sp. n. (Abb. 28–30).

Schwarz, Elytren in den vorderen 4/5 hellziegelrot bis orangerot.—Stirn flach vertieft, Fühlerbeulen sehr gross, flach, ohne Mittelfurche.—Fühler robust, 3.–10. Glied tief gezahnt, locker stehend, Zähnung nach vorn etwas abnehmend, Behaarung sehr dicht und stark.—Prothorax (Abb. 28), am Hinterrand breiter als in der Mitte hoch, Ränder, namentlich, die seitlichen, stark erhöht, Mittelfurche bis über die Mitte reichend, deutlich, Randpunktierung kräftig, namentlich an den Seiten.—Elytren äusserst dicht behaart, so dass Rippen und Skulptur nicht erkennbar sind.

Länge: 14 mm. Breite (hum): 3 mm.

Kina-Balu: Kenokok 3,300′, 24.4.29.

1 ♀.

Die Art ist ein Reise in der Gattung und fast doppelt so gross wie die Gattungsgenossen. Die Art der Ausfär-

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are new. From the mountains of Borneo we have the following number of species with banded elytra.

From	Mt.	Dulit	3 spp.
„	„	Tibang	8 spp.
„	„	Kinabalu	9 spp.
		Total	20 spp.

bung trennt von allen bekannten Arten, ein Vergleich ist nur mit der folgenden nötig.

11. **Melampyrus nepos** sp. n.

In der Ausfärbung und im Habitus ganz mit *giganteus* übereinstimmend. Die Unterschiede sind folgende: *nepos* ist nur halb so gross wie *giganteus*, die Fühlerglieder sind schlanker und länger und die Elytren haben kräftig entwickelte Rippen und Gitterung die nicht durch Behaarung verdeckt ist.

Lange: 8 mm. Breite (hum.): 1.5 mm.

Kina-Balu: Lumu Lumu 5,500′, 13.–14.4.29.

2 ♀♀.

12. **Metanoeus pendleburyi** sp. n. (Abb. 31).

Einfarbig schwarz, Elytren orangegelb, Basis in Ausdehnung des Schildchens und der Hinterrand keilförmig schwarz.—Fühlerglieder gross, 3.–10. tief gezähnt, nach vorn werden die Glieder schmaler und die Zahnung schwächer.—Prothorax am Hinterrand breiter als in der Mitte hoch, Vorderrand in der Mitte etwas eingebuchtet, Vorderseiten schräg, dachförmig abfallend, Seiten fast gerade, Hinterecken rechteckig, Areolen deutlich, die seitlichen fehlen.

Länge: 10–12 mm. Breite (hum.): 2–2.2 mm.

Kina-Balu: Lumu Lumu 5,500′, Kenokok 3,300′, 9–15.4.29.

3 ♀♀.

Dies Gebirgstier ist nur mit *flavofasciatus* aus den Bergen Ost-Borneos zu vergleichen. Die Unterschiede sind folgende:

flavofasciatus	*pendleburyi*
Prothorax ohne seitliche Areolen auch die vorderen verschwommen. Auf den Elytren lässt die schwarze Färbung nur eine schmale, rotgelbe Binde frei, die schwarzen Partieen sind quergeteilt.	Areolen deutlich, scharf ausgeprägt, nur die seitlichen undeutlich oder fehlend.—Auf den Elytren findet sich die Schwarzfärbung and der Basis nur in der Ausdehnung des Schildchens, am Hintererand keilförmig nach dem Aussenrand zu vorstehend, gelbe Binde sehr breit und nicht quergeteilt.

The species found in several localities have been naturally listed only once The division among the separate genera is as follows:

1. *Lycostomus xanthomelas* Kln.
2 *Cladophorus monticola* Kln.
3 „ *nigropallidus* Kln.
4. *Xylobanus assimilis* Kln.
5. „ *cognatus* Kln
6. „ *contrarius* sp. n.
7 „ *pendleburyi* sp. n.

13. **Metanoeus montanus** sp. n. (Abb. 32).

Ist mit *pendleburyi* zu vergleichen. Die Unterschiede sind folgende: Die helle Partie auf den Elytren ist lehmgelb und hat viel kleinere Ausdehnung. Der Hinterrandsteil ist zu ⅔ schwarz, das Aussehen beider Arten ist dadurch gänzlich verschieden.—Prothorax quadratisch, Areolen viel kräftiger, auch die seitlichen sind noch deutlich erkennbar.

Länge: 12 mm. Breite (hum.) : 2.5 mm.

N.—W.—Borneo: Mt. Dulit, 1,400–1,700 m. Von Mjöberg gesammelt. Typus (♀), in meiner Sammlung.

14. **Xylobanellus postsignatus** sp. n. (Abb. 33–36).

Schwarz, Elytren blutrot, Hinterrandsteil in ⅓–½ der Länge schwarz, die schwarze Zeichnung setzt sich am Aussenrand nach vorn fort; stark glänzend, nur die Elytren matter.—Kopf gewölbt, Fühlerbeulen ganz obsolet, fast fehlend, ohne Mittelfurche, Punktierung und Behaarung sehr zart und einzeln.—Fühler schlank, 3. Glied spatelförmig, die folgenden länger und schmaler, nach vorn an Breite, nicht an Länge abnehmend, Behaarung dicht, kurz.—Prothorax breiter als lang, einem *Conderis* ähnlich (Abb. 33.) Areole breit und flach, Punktierung am Vorderrand gross, tief, Behaarung und Skulptur sehr schwach.—Elytrengitterung quadratisch, seltener längs- oder querrechteckig, kurz behaart.

Länge: 5–6 mm. Breite (hum.) : 1 mm circa.

Kina-Balu: Lumu Lumu, 5,500′, 16.–17.4.29.

2 ♀♀.

Die nächstverwandte Art ist *reticulatus* Kln. von Java. Die hellen Farbenpartieen sind bei *reticulatus* lehmgelb, bei *postsignatus* blutrot. Bei ersterer Art nimmt die schwarze Elytrenpartie aber nur 1/5 der Länge ein, bei *postsignatus* ⅓, ausserdem sind die Farben in der Anordnung anders. Bei *reticulatus* sind auf dem Prothorax Ränder und Areolen zum Teil gelb gefärbt, bei *postsignatus* dagegen ist das ganze Organ einfarbig schwarz. Bei *reticulatus* ist die Elytrengitterung vorherrschend langrechteckig, bei *postsignatus* ist sie ausgesprochen quadratisch.

8. *Bulenides duplicatus* Kln.
9. ,, *flavoreticulatus* sp. n.
10. *Cautires asper* Kln.
11. ,, *thoracicus* sp. n.
12. ,, *bicoloratus* sp. n.
13. ,, *asperoides* sp. n.
14. ,, *kinabalensis* sp. n.

15. **Scarelus juvencus** sp. n. (Abb. 37–38).

Schwarz, nur die Elytren blutrot, matt, Behaarung kurz. Fühler weit über die Elytren hinausragend, 3.–11. Glied gleichlang, nach vorn langsam schmaler werdend, Behaarung dicht, kurz, anliegend.—Prothorax am Hinterrand etwa so lang wie in der Mitte hoch (Abb. 37.), Ränder schmal aber kräftig aufgebogen, Areole sehr schmal.—Auf den Elytren sind alle Rippen entwickelt, nur die 1. ist etwas schwächer als die übrigen, Gitterung vorherrschend quadratisch, durch die Behaarung noch deutlich erkennbar.

Länge: 7.5 mm. Breite (hum.): 1 mm circa.

Kina-Balu: Kenokok 3,300′, 26.4.29.

1 ♂.

Die Art ist mit *rollei* Pic zu vergleichen, die ebenfalls vom Kina-Balu bekannt ist. Die Underschiede liegen in der Ausfärbung, da bei *juvencus* die Elytren ganz rot, sind, ferner sind auf den Elytren alle Rippen entwickelt, nicht nur 2 wie bei *rollei*.

15. **Dihammatus montanus** sp. n.

Schwarzbraun, 6.–11. Fühlerglied und die Elytren lehmgelb.—Prothorax breiter als lang, Vorderecken deutlich wenn auch rund, Hinterecken spitz, jederseits des Aussenrandes an den Vorderund Hinterecken mit einer grossen Vertiefung; Mittelfurche in der hinteren Hälfte tief, nach dem Hinterrand zu erweitert.—Behaarung der Elytren dicht.

Länge: 6 mm. Breite (hum.): 1 mm circa.

Kina-Balu: Lumu Lumu, 5,500′, 15–16.4.29.

2 ♀♀.

Die Art ist leicht durch die zum Teil hellen Fühlerglieder von allen bekannten zu trennen.

17. **Libnetis nigricolor** sp. n. (Abb. 39–40).

Einfarbig schwarz.—Stirn flach, Fühlerbeulen ganz platt, nur am Rande etwas verdickt, Augen gross.—Prothorax am Hinterrande etwas breiter als in der Mitte hoch, Vorderecken gerundet, Hinterecken etwas nach aussen vorgezogen, Vertiefung am Hinterrand dreieckig, tief, Randpunktierung kräftig.—Fühler schlank, 3. Glied kürzer als

15. *Metanoeus montanus* sp. n.
16. „ *flavofasciatus* Kln.
17. „ *pendleburyi* sp. n.
18. *Melampyrus diversesignatus* Kln.
19. *Calochromus basipennis* Pic.
20. „ *rubrofasciatus* Kln.

There can be no doubt that there is present here a quite decided correlation between altitude and colour scheme. Certainly, species are found also in the lower

das 4., 5.–10. allmählich schmaler und kürzer werdend, 11. kaum länger als das 10., Behaarung auf allen Gliedern dicht, kräftig.—Schildchen zungenförmig, nicht eingekerbt.—Auf den Elytren sind die 2. und 4. Rippe ganz durchgehend, die 3 erreicht den Hinterrand nicht ganz, die 1. ist stark verkürzt, Behaarung kurz, kräftig, die Skulptur nicht ganz verdeckend.

Läng: 9.5 mm. Breite (hum.) : 1.5 mm. circa.

Kina-Balu: Kamborangah 7,200′, 3.4.29.

1 ♂.

Das kurze 3. Fühlerglied stellt sie Art zu *Libnetis.* Allerdings ist sie ein Aussenseiter: ein Riese unter den Zwergen. Der Prothorax ist auffallend hoch. Aber trotzdem muss *nigricolor* bei *Libnetis* bleiben. Mit anderen Arten besteht keine Collision, da es keinen einfarbigen schwarzen *Libnetis* gibt.

18. **Lyropaeus monticola** sp. n. (Abb. 41).

Schwarz, nur die Elytren in der hinteren Halfte (Abb. 41). schmutzig-strohgelb.—Fühler schlank, Glieder walzig, vom 3. ab nach vorn kürzer werdend.—Stirn tief eingedrückt, Fühlerbeulen robust, Mittelfurche tief.—Prothorax trapezoid, am Hinterrand breiter als in der Mitte hoch, Hinterecken spitz nach aussen vorgezogen, auf der Mitte 2 grossen Vertiefungen, die nicht beborstet sondern mehr glatt sind.—Schildchen zungenförmig, hinten flach eingebuchet.—Auf den Elytren sind nur die Rippen in der basalen Hälfte deutlich entwickelt, in der hinteren Hälfte fehlen alle Rippen.

Länge: 13 mm. Breite (hum.) : 2 mm.

Kina-Balu: Kamborangah 7,200′, 4.4.29.

1 ♂.

Die Art ist mit keiner anderen zu verwechseln. Die Ausfärbung ist bisher in der Gattung unbekannt und überhaupt erst einmal, in der Gattung *Lycostomus,* festgestellt worden. Wie bei der vorliegenden, handelt es sich auch bei *Lycostmus* um eine alpine Art. Es ist wahrscheinlich,

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areas but they recede, however. Once there appears a perceptible deepening or brilliance in the coloration then one cannot deny that a tendency to colour variation exists. Thus, species exist that have black colour only at the base of the elytra and then a further type that has the characteristic that the pale colours on the elytra close to the hind margin become still perceptibly paler. These are all peculiarities of coloration that one meets with in mountain regions only.

If the collected material originated only from Mt. Kinabalu one could agree that it was only a local phenomenon. I have discovered from Mt. Kinabalu also, as a matter of fact, two of Mjöberg's species from Mt. Dulit. But the fact that the dass die gleiche Farbenanordnung auch noch in anderen Gattungen gefunden wird und dass es sich um einen, für hohe Lagen spezifischen, Färbungstypus handelt.

19. **Lyropaeus rubrostriatus** sp. n. (Abb. 42–43).

Schwarz, nur auf den Elytren sind die Rippen in mehr oder weniger grosser Ausdehnung blutrot behaart. Sonst wie *monticola.*

Länge: 10 mm. Breite (hum.): 2 mm.

Kina-Balu: Lumu Lumu, 5,500′, 11.4.29.

2 ♂♂.

Auch diese Art kollidiert mit keiner bisher bekannten, und ist durch die Ausfärbung der Elytren charakterisiert. Die Ausfärbung entspricht einem Typ, der auf Borneo mehrfach beobachtet worden ist und in anderen Gattungen vorkommt. So bei *Lycostomus, Cautires* und *Xylobanus.* Die hierhergehörigen Arten müssen aber nicht notwendigerweise Gebirgsbewohner sein. Die Ausfärbung ist also kein montaner Typ. Die Ausdehnung der roten Rippenbehaarung ist, wie es scheint, ziemlich variabel. In den Abb. 42 und 43 sind die Extremen wiedergegeben. (Die Farben sind umgekehrt, das Weisse ist in Wirklichkeit schwarz, das Schwarze, die Rippen, sind rot.)

NACHTRAG.

FUNF NEUE *PLATERODINI* (*LYCIDAE*) AUS DEM KINA-BALU-GEBIRGE.

Von R. KLEINE,—*Stettin.*

Aus der Lycidenausbeute, die Herr H. M. Pendlebury aus den höheren Lagen des Kina-Balu-Gebirges mitgebracht hatte, habe ich den grössten Teil bereits bearbeitet. Die Durcharbeitung des Materials ergab, dass in den höheren Gebirgslagen Borneos ganz allgemein eine vom Tiefland verschieden gefärbte Lycidenfauna besteht. Die kleinen Lycidenformen, wie es die *Platerodini* sind, machen hiervon eine Ausnahme. Bei ihnen ist die Ausfärbung anders, aber doch wieder innerhalb ihrer Verwandtschaft charakteris-

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same colorations are present in south east Borneo gives one to think and challenges our attention to further studies.

The new species are described herewith. With one exception all were collected by Mr. Pendlebury. All the types are in the Selangor Museum, Kuala Lumpur; cotypes where they exist are in my collection.

Of the species known already, the following have been rediscovered:

1. *Cautires pauperulus* Bourg.
   Kiau, 3,000 feet. The material is very extensive and belongs to the pale forms. The prothorax is only partly pale brown, the pale part of the elytra moreover has no dark area. The influence of the mountain zone makes itself noticeable.

tisch. Alle sind tief braunschwarz und nur die Elytren sind von strohgelber Farbe, sodass man auf den ersten Anblick zu der Ansicht kommen kann, es liege überhaupt nur eine Art vor. Alle Typen sind im F.M.S. Museum, Cotypen, soweit vorhanden, sind in meiner Sammlung.

20. **Plateros kinabalensis** sp. n. (Abb. 44, 45).

Tief braunschwarz, Basis aller Schenkel und die Fühler etwas heller, Elytren hell strohgelb.—Stirn so breit wie der halbe Augendurchmesser.—Fühler vom 3. bis 10. Glied deutlich gezahnt und einzeln, lang und kräftig behaart.—Prothorax mit stark vorgezogenen spitzen Hinterecken.—Elytren dicht behaart, sodass die Rippen unsichtbar sind.

Länge: 6 mm. Breite (hum.) 1 mm circa.

Lumu-Lumu 5,500′ 14.4.1929. 3 ♂♂.

Aus dem orientalischen Gebiet isk keine Art dieser charakteristischen Ausfärbung bekannt. Dazu kommt noch die eigenartige Gestalt der Fühler, die in ihrer Zähnung Anklänge an *Ditoneces* erkennen lassen. Die Abgrenzung beider Gattungen ist überhaupt, wie so häufig bei den Lyciden, schwierig und nur die Extreme sind gut trennbar. Da die Zähnung aber nur schwach ist, steht die Art wohl besser bei *Plateros*.

21. **Dihammatus monticola** sp. n. (Abb. 46, 47).

Ausfärbung wie bei *Plateros*. Die Schenkel sind aber nur wenig oder garnicht aufgehellt; die Fühler sind nur an der Basis schwarzbraun, etwa bis zum 6. Gliede, vom 7. ab hellbraun oder schmutzig gelb, Behaarung lang, hell; 3. Glied länger als das 2., das nur knopfförmig ist.—Prothorax quer, Vorderrand gerade, Vorderecken rundlich, Seiten nach hinten erweitert, Hinterecken zwar schwach, aber doch deutlich vorgezogen, Skulptur sehr grob, quer runzlich. Behaarung kurz und dicht. Elytren gleichfalls so dicht behaart, dass Rippen und Skulptur verdeckt sind.

Länge: 6 mm. Breite (hum.) 1 mm circa.

Lumu-Lumu 5,500′ 8.4.1929. 1 ♂.

22. **Dihammatus chaseni** sp. n. (Abb. 48, 49).

Mit der vorigen Art in der Ausfärbung vollständig überein stimmend. Die Unterschiede sind folgende: Das 3. Fühlerglied ist kaum länger als das 2. und von gleicher

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2. *Cautires asper* Kln.
Kenokok, 3.300 ft. 22.4.29. A mountain zone species which has been described already from Mjöberg's Mt. Dulit collection.
3. *Cautires cognatus* Bourg.
Kenokok, 3.300 ft. 22.4.29.
4. *Lycostomus gestroi* Bourg.
Kiau, 3.000 ft. 28.3.29.

Gestalt, die folgenden Glieder sind nicht keilförmig nach vorn erweitert, sondern parallel. Der Prothorax ist nicht breiter als lang, sondern quadratisch, Vorderrand dachförmig abfallend, Vorderecken kantig winklig, Seiten gerade, Hinterecken rechtwinklig, nicht vorgezogen ohne jede Querskulptur und nur am Vorderrand in grösserer Ausdehnung mit tiefer Punktierung. Behaarung sehr schwach, auf dem Diskus fast fehlend.

Länge: 6 mm. Breite (hum.) 1 mm circa.

Lumu-Lumu 5,500′ 16.–17.4.1929. 2 ♀♀.

23. **Libnetis pendleburyi** sp. n. (Abb. 50, 51).

Ausfärbung gleich *Plateros*. Fühler sehr schlank. Vom 3. Glied ab 5 bis 6 mal so lang wie breit, parallel, Behaarung dünn und einzeln, den Grund nicht verdeckend.—Prothorax mit nur wenig schrägen Vorderkanten, Vorderecken winklig, Seiten nach hinten erweitert, Hinterecken spitz vorgezogen.—Elytren dicht behaart, Rippen aber noch erkennbar.

Länge: 6–8 mm. Breite (hum.) 1 mm circa.

Lumu-Lumu, 5,500′, Kamborangah 7,200′ March bis April 1929.

2 ♂♂, 2 ♀♀.

24. **Libnetis opulentus** sp. n. (Abb. 52, 53).

Von *pendleburyi* durch folgende Merkmale unterschieden: Fühler gedrungen, kurz, Glieder höchstens 3 bis 4 mal so breit, dicht behaart und dadurch nicht glänzend, sondern matt aussehend.—Prothorax mit runden Vorderkanten und unscharfen Vorderecken, Seiten gerade, Hinterecken nicht vorgezogen, sondern rechtwinklig, Elytren wie bei der vorhergehenden Art.

Länge: 5 mm. Breite (hum.) 1 mm circa.

Lumu-Lumu 5,500′, 15.4.1929. 1 ♂.

Figurenverzeichnis.

Abb. 1. u. 2. Elytrengitterung, 3 Farbenverteilung von *Cautires kinabaluensis* sp. n.

„ 4. u. 5. Elytrengitterung von *Cautires asperoides* sp. n.

„ 6. Prothorax, 7. Farbenverteilung, 8 Elytrengitterung von *Cautires bicoloratus* sp. n.

„ 9. Prothorax, 10. Farbenverteilung, 11. Elytrengitterung von *Cautires thoracicus* sp. n.

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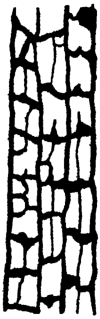
5. *Dilophotes pulchellus* Kln.
Lumu Lumu, 5,500 ft 12.4.29.
6. *Lyropaeus optabilis* Kln.
Same locality, 14.4.29.
7. *Calochromus nigromarginatus* Bourg.
Kiau, 3,000 ft. 23.3.29. This species is recorded also in the lowland zone (Kabayau, 600 ft.).
8. *Calochromus basipennis* Pic.

„ 12. Prothorax, 13. mittlere Fühlerglieder, 14. Elytrengitterung von *Xylobanus longereticulatus* sp. n.
„ 15. Prothorax, 16. 3.–5. Fühlerglied, 17. Elytrengitterung, 18. Farbenverteilung von *Xylobanus pendleburyi* sp. n.
„ 19. Prothorax, 20. Elytrengitterung, 21. Farbenverteilung von *Xylobanus contrarius* sp. n.
„ 22. Prothorax, 23. Elytrengitterung, 24. Farbenverteilung von *Bulenides lyciformis* sp. n.
„ 25. Prothorax, 26. Elytrengitterung, 27. Farbenverteilung von *Bulenides flavoreticulatus* sp. n.
„ 28. Prothorax, 29. mittleres Fühlerglied, 30. Farbenverteilung von *Melampyrus giganteus* sp. n.
„ 31. Farbenverteilung von *Metanoeus pendleburyi* sp. n.
„ 32. Farbenverteilung von *Metanoeus montanus* sp. n.
„ 33. Prothorax, 34. 1.–5. Fühlerglied, 35. Elytrengitterung, 36. Farbenverteilung von *Xylobanellus postsignatus* sp. n.
„ 37. Prothorax, 38. 1.–4. Fühlerglied von *Scarelus juvencus* sp. n.
„ 39. Prothorax, 40. 1.–5. Fühlerglied von *Libnetis nigricolor* sp. n.
„ 41. Farbenverteilung von *Lyropaeus monticola* sp. n.
„ 42. u. 43. „ „ „ *rubrostriatus* sp. n.
„ 44. 1. –5. Fühlerglied.
„ 45. Prothorax von *Plateros kinabalensis* sp. n.
„ 46. 1. –4. Fühlerglied.
„ 47. Prothorax von *Dihammatus monticola* sp. n.
„ 48. 1. –4. Fühlerglied.
„ 49. Prothorax von *Dihammatus chaseni* sp. n.
„ 50. 1. –4. Fühlerglied.
„ 51. Prothorax von *Libnetis pendleburyi* sp. n.
„ 52. 1. –4. Fühlerglied.
„ 53. Prothorax von *Libnetis opulentus* sp. n.

According to an illustration that the author had put at my disposal already, this must be considered a mountain zone species As a matter of fact Mr Pendlebury has now rediscovered the species at Lumu Lumu, 5,500 feet.

Among these eight species there are two purely mountain zone species also. It is remarkable how few species have spread from the lowlands to the mountain Among the remaining six some are not typical of the lowland zone, belonging rather to the mountain zone fauna.



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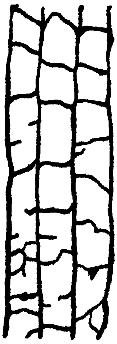

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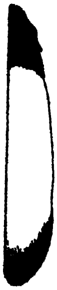

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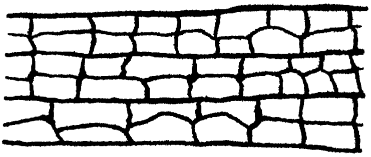

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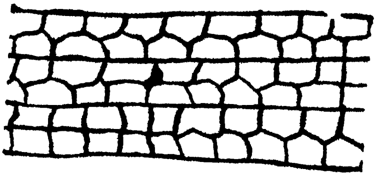

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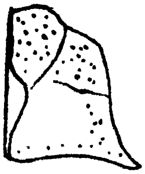

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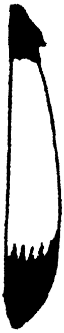

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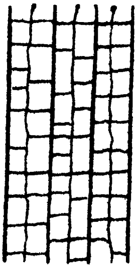

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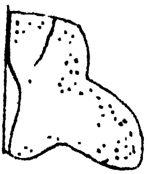

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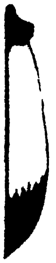

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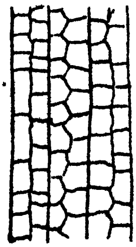

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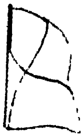

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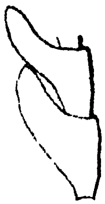

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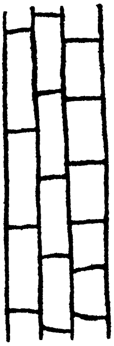

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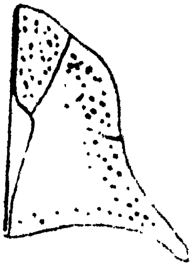

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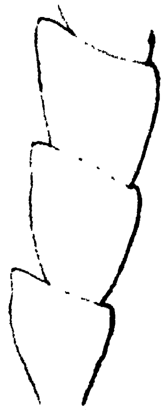

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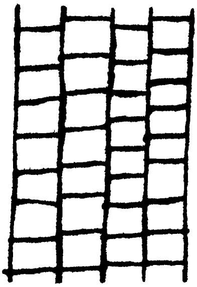

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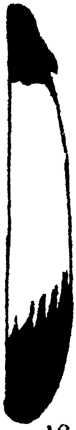

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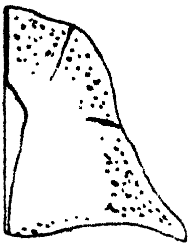

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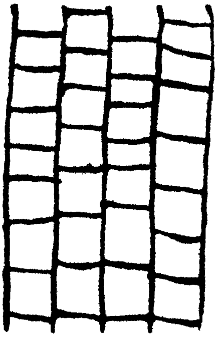

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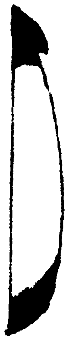

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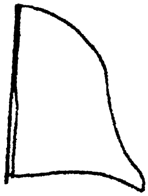

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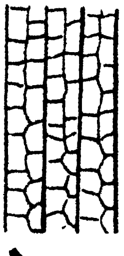

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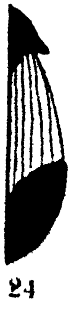

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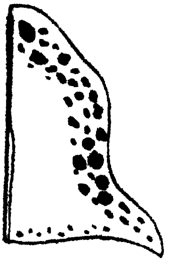

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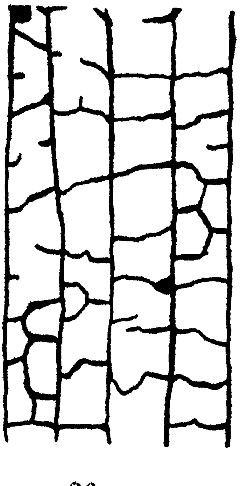

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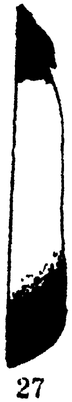

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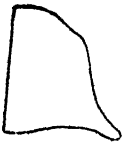
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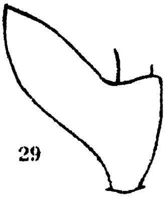
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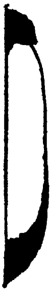
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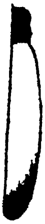
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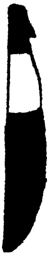
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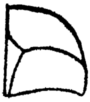
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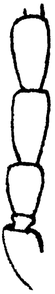
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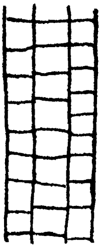
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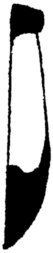
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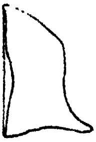
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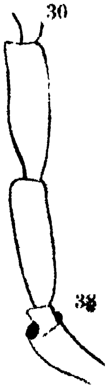
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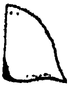
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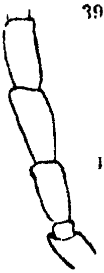
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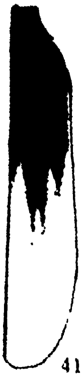
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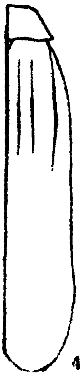
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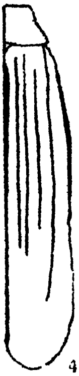
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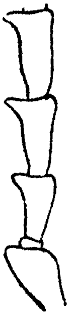
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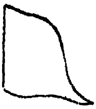
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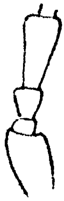
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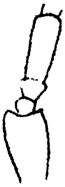
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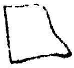
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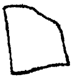
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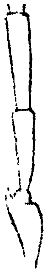
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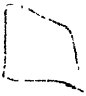
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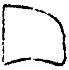
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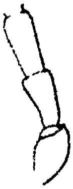
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IX. A LIST OF CERTAIN LAMELLICORNIA FOUND ON MT. KINABALU.

By H. M. PENDLEBURY.

The following is a list of the Lucanidae (determined by P. Nagel), Dynastinae and Cetoniinae (determined by G. J. Arrow), that were collected during our visit to Mount Kinabalu between March and May 1929.

Most of the species mentioned are well known, common on the mountain, and call for no further comment; the material, however, included four new Cetoniinae (two each in *Glyptothea* and *Macronota*) which have been described recently by Mr. Arrow (Ann. Mag. Nat. Hist., (10), ix, 1932, pp. 125–128).

The Rutelinae are reported on by Dr. F. Ohaus in another part of this *Journal* (*antea*, pp. 122–127); the Coprinae, Melolonthinae (with the exception of one species, *Hoplia magnifica* Arr., *tom. cit.*, p. 190), and Passalidae have yet to be studied.

Speaking generally, the specimens were found more plentifully in the rather open country on the lower slopes of the mountain (where we spent only a few days), than in the heavy primeval forest which begins at about 4,000 feet. The highest elevation at which we found Lamellicornia was 7,200 feet. In the following list, where more than one locality is mentioned for a species, the lowest and highest altitudes are given.

LUCANIDAE.

(Determined by P. Nagel).

Odontolabis brookeanus Voll.

Kabayau, Koung, Kiau, and Tenompok Pass, 600–4,700 feet. A common species found chiefly at Kiau (3,000 feet).

Odontolabis lowii Parry.

Kiau and Lumu Lumu, 3,000–5,500 feet. April.

Odontolabis imperialis Moll.

Kiau, 3,000 feet. March.

Odontolabis spectabilis Boil.

Kiau, 3,000 feet. March.

Odontolabis femoralis Waterh.

Marei Parei, 5,000 feet. April.

Cyclommatus magnificus Nagel.

Lumu Lumu, 5,500 feet. April.

Cyclommatus consanguineus Boil.

Kiau, 3,000 feet. March, April.

Eurytrachelus taurus F.

Kabayau-Koung, Lobang, 1.000–4,000 feet. April–May.

Eurytrachelus thoracicus Moll.

Lumu Lumu, 5,500 feet. April.

Eurytrachelus mandibularis Moll.

Kiau, 3,000 feet. April.

Eurytrachelus prosti Boil.

Kiau, Tenompok Pass, 3,000–4,700 feet. March, April.

Eurytrachelus burmeisteri Nagel.

Kiau, 3,000 feet. March.

Aegotypus trilobatus Parry.

Kiau, 3,000 feet. April.

Gnaphaloryx burmeisteri Nagel.

Kabayau, 600 feet. May.

Aegus ogivus Deyr.

Kiau, Lumu Lumu, 3,000–5.500 feet. April, May.

Aegus hamatus Latr.

Kiau, 3,000 feet. April.

Aegus pygmaeus Latr.

Kiau, 3,000 feet. April.

Nigidius kinabaluensis Boil.

Koung, Kiau, 1,300–3,000 feet. March.

DYNASTINAE.

(Determined by G. J. Arrow).

Trichogomphus lunicollis var. **alcides**

Kiau, 3,000 feet. March.

Trichogomphus lunicollis Burm.

Koung, Kiau, 1,300–3,000 feet. March–April. Common.

Trichogomphus simson Voll.

Koung, Kiau, Lobang, 1,300–4,000 feet. March–April. Common.

Pseudohomonyx borneensis Arr.

Kiau, Kenokok, 3,000–4,000 feet. March–April.

CETONIINAE.

(Determined by G. J. Arrow).

Theodosia magnifica Rths.

Kiau, 3,000 feet. March–May.

Theodosia telifer Bates.

Kiau, 3,000 feet. March.

Theodosia westwoodi Thoms.

Kiau, 3,000 feet April

Clinteria flavonotata G. & P.
Kiau, 3,000 feet. March.
Thaumastopeus nigritus Froel.
Kiau, 3,000 feet. April.
Chalcothea affinis Voll.
Koung-Kabayau, Kiau, 1,000–3,000 feet. March–May.
Glyptothea laevis Arr.
Lumu Lumu, 5,500 feet. April.
Glyptothea pubescens Arr.
Lumu Lumu, Marei Parei, 5,000–5,500 feet. April, May.
Pseudochalcothea macrophylla Jans.
Lumu Lumu, 5,500 feet. April.
Pseudochalcothea planiuscula Bates.
Kiau, 3,000 feet. March.
Pseudochalcothea auripes Westw.
Kiau, Tenompok Pass, 3,000–4,700 feet. March, April.
Pseudochalcothea pomacea Bates.
Kiau, 3,000 feet. March–May.
Pseudochalcothea staudingeri Poll.
Kiau, 3,000 feet. March.
Pseudochalcothea spathulifera Bates.
Kenokok, Tenompok Pass, Lumu Lumu, 3,300–5,500 feet. April.
Macronota regia F.
Kiau, 3,000 feet. March.
Macronota kinabaluana Arr.
Lumu Lumu, 5,500 feet. April.
Macronota variegata Wall.
Kabayau, Koung, 600–1,300 feet. May.
Macronota egregia Guer.
Kiau, Tenompok Pass, 3,000–4,700 feet. April.
Macronota lobata Arr.
Lumu Lumu, 5,500 feet. April.
Protaetia fusca Herbst.
Kiau, 3,000 feet. April.
Protaetia borneana Sch.
Kiau, 3,000 feet. April.
Protaetia fulva Sch.
Kiau, Marei Parei, 3,000–5,000 feet. March, April.
Glycyphana sinuata Wall.
Kiau, 3,000 feet. March.

X. LES CERCOPIDES RECUEILLIS SUR LE MONT KINABALU PENDANT 1929.

Par le Dr. V. LALLEMAND (*Uccle*).

Les Cercopides indiqués ci-dessous ont été recueillis sur le mont Kinabalu (Borneo) pendant mars, avril, et mai, 1929, par Mr. H. M. Pendlebury de Kuala Lumpur, F.M.S.

L'altitude des diverses localités citées selon les étiquettes est comme il suit:—

Kabayau—600 feet (210 m.).
Koung—1,300 feet (433 m.).
Kiau—3,000 feet (1045 m.).
Kenokok—3,300 feet (1,150 m.).
Kiau—Tenompok Pass 3,000–4,700 feet (1,045–1,650 m.).
Lobang—4,000 feet (1,400 m.).
Lumu Lumu—5,500 feet (1,792 m.).
Kamborangah—7,200 feet (2,510 m.).

Liste des espèces.

Clovia conifer Wlk.

Kabayau, 3 ex.

Clovia exclamans Wlk.

Kenokok, Lobang, Lumu Lumu, Kamborangah du 31 mars à fin d'avril, 12 ex.

Clovia expressa Wlk.

Kabayau, Kiau, mars et mai, 3 ex.

Clovia kinana Lall. sp. n.

Koung, 1,300 feet, 1 ex.

Euclovia convexa Dist.

Lumu Lumu, avril, 3 ex.

Plinia pilosa Dist.

Kiau, avril, 1 ex.

Aphrophora sp. ?

Kenokok, avril, 1 ex.

Trichoscarta spp. ?

Kenokok, avril, 2 ex.

Eoscarta lumuensis Lall. sp. n.

Marei Parei, 5,000 feet; Lumu Lumu, 5,500 feet; Kamborangah, 7,200 feet; mars, avril, 25 ex.

Neocercopis kenokokana Lall. gen. et sp. n.
Kenokok, 3,300 feet; 24 avril 2 ex.

Aufidus kinabaluensis Lall. sp. n.
Lumu Lumu, 5,500 feet; Kamborangah 7,200 feet; avril, 35 ex.

Aufidus minutus Lall. sp. n.
Lumu Lumu, 5,500 feet; Kamborangah 7,200 feet avril, 4 ex.

Phymatostetha selangorina Lall. var. **rubescens** Lall. var. n.
Kiau—Tenompok Pass 3,000 ft.–4,700 ft. Mai, 1 ex.

Suracarta tricolor St. Farg. et Serv. **niobe** Bredd.
Kabayau, Kiau, Kenokok. avril, mai, 25 ex.

S. **tricolor borneensis** Schm.
Kabayau; Kiau: avril, mai, 26 ex.

Simeliria maxima Lall.
Kiau; mars, 1 ex.

Ectemnonotum montanum Lall. sp. n.
Kabayau, 600 feet; 12 mai, 2 ex.

Ectemnonotum acuminatum Schm.
Kabayau, mai, 7 ex.

Ectemnonotops kiauensis Lall. sp. n.
Kiau, 3,000 feet; Kenokok 3,300 feet. avril, 4 ex.

Leptataspis borneensis Schmidt.
Kiau; Kiau—Tenompok Pass; Kenokok; Kamborangah, Mars et avril, 36 ex.

Leptataspis masoni Dist.
Kamborangah 29 mars, 5 ex.

Leptataspis fortunata Schmidt.
Kenokok, Lumu Lumu, 2 ex.

Leptataspis cassandra Bredd.
Kabayau, Kiau, Kiau—Tenompok Pass; Kamborangah, mars–avril, 16 ex.

Descriptions des nouvelles espèces.

Clovia kinana sp. n.

Vertex jaune, sauf le bord antérieur et trois lignes transversales noires, la troisième de celles-ci s'étendant d'un oeil à l'autre: pronotum noir, avec une bande jaune transversale; écusson jaune élytres noirs à partie apicale légèrement brune, sur ceux-ci deux bandes jaunes, la première, un peu oblique, part du milieu du clavus et se dirige vers le bord externe qu'elle n'atteint pas, large à sa base, elle va en s'amincissant pour finir en pointe, la seconde bande part du bord externe vers l'angle apical qu'elle n'atteint pas; clypeus et front noirs, sur ce dernier deux latérales jaunes qui se réunissent en avant et se prolongeant en jusque sur la mésonotum; milieu du mésosternum, métasternum et pattes ocres; partie apicale des tibias antérieurs et abdomen bruns.

Longueur: 8 mm.

Localité: Koung, 1,300 feet (Musee de Kuala Lumpur)

Type: ma collection; paratypes: collections dé Musée de Kuala Lumpur et du Musee national hongrois de Budapest.

Eoscarta lumuensis sp. n.

Tête, pronotum, écusson brun-noir; élytres bruns, un peu plus foncés vers la base, légèrement transparents; tibias antérieurs et médians rougeâtres; sternum, toutes les cuisses, tibias postérieurs et abdomen bruns; toute la surface supérieure est recouverte d'une villosité rousse. Sillon du front large et profond, naissant non loin du bord supérieur.

Longueur: 12 mm.

Localités: Lumu Lumu, (5,500 ft.), Kamborangah (7,200 ft.), mars et avril, 1929.

Genus **Neocercopis** gen. n.

Vertex à peu près plan, déclive en avant, un peu plus long que large, a partie frontale saillante, ocelles très proches l'un de l'autre, situés de chaque côté d'une très légère saillie longitudinale, médiane; front saillant; aplati et strié sur les côtés, lisse à la partie médiane, vu de côté, il montre un angle un peu plus grand qu'un droit, au niveau de l'angle se trouve une petite fossette peu profonde; pronotum assez rugueux, transversalement strié; sur les élytres le médian et le cubitus se soudent sur le ¦ basal et le radius se bifurque en arrière du milieu, à l'extrémité de trouvent quatre cellules, entre le radius 1 et le bord costal peuvent exister 2 à 3, rameaux formant 2 à 3 cellules; immédiatement après l' extrémité du clavus les élytres font une légère saillie et c'est a cet endroit qu'ils sont le plus larges, leur longueur égale un peu de 2½ fois leur largeur; une forte épine sur les tibias postérieurs.

Neocercopis kenokokana sp. n.

Vertex, pronotum, écusson ocre-brun; partie frontale du vertex et front rouges; premier article du rostre, cuisses, tibias antérieurs et médians ocre-rouge; sternum, pattes postérieures ocres; abdomen ocre-brun clair; extrémité du rostre, des tarses et des épines des pattes postérieures, tarses des deux premières paires de pattes bruns; ailes enfumées; élytres brun-clair à la base, puis d'un jaune-brunatre clair, enfin roses à la partie apicale; extrémité du clavus, une bande transversale composée de trois taches et le bord apical noirs; la premère des taches, allongée, part du bord externe et s'étend sur la nervure transversale bordant en avant les deux premières cellules apicales, la deuxième, petite, occupe l'extrémité de la troisième cellule, enfin la troisième tache s'étend sur la plus grande partie de la quatrième cellule.

Longueur: 10 mm.

Localité: Kenokok (3,300 ft.) (avril, 1929).

Aufidus kinabaluensis sp. n.

Vertex noir, à la partie antérieure une tache jaune transversale presque rectangulaire; sur la partie antérieure du pronotum une bande transversale jaune bordée en arrière d'une bande noire, partie postérieure brune; écusson brun; élytres brun-clair brillants, transparents, bordés extérieurement de brun-noir sur environ les 3/5 antérieurs, et vers la partie apicale, nervures brunes; ailes enfumées; yeux noirs; front ocre, à sa partie superieure une bande noire allant d'un oeil à l'autre; pro- et mésosternum, cuisses antérieures et médianes, pattes postérieures ocres, tibias antérieurs et médians, extrémité des postérieurs bruns; mésosternum noir; abdomen brun, plus foncé sur les côtés; surface supérieure recouverte d'une villosité rousse.

Longueur. 11 mm.

Localités: Lumu Lumu, Kamborangah (mars et avril 1929) nombreux exemplaires ♂ et ♀.

Aufidus minutus sp. n.

Voisin du précédent, s'en distingue par la taille, l'absence de bande noire sur le front et la bordure externe brun-noir des élytres, celle-ci est continue de la base à l'extrémité; l'abdomen le sternum et les pattes sont ocres.

Longueur: 6.5 à 7 mm.

Localité: Lumu Lumu, 5,500 ft. avril, 1929.

Phymatostetha selangorina Lall. var. **rubescens** var. n.

Les bords antérieur et latéro-antérieurs du pronotum, la bande du bord interne (le long de l'écusson), les deux transversales, ainsi que la tache arrondie de la partie apicale des élytres sont rouge foncé, tandis qu'ils sont ocre-jaune chez l'espèce.

Localité: Kiau—Tenompok, entre 3,000 et 4,7000 ft. mai 1929.

Ectemnonotum montanum sp. n.

Voisin de *E. ferale* Butl., noir brillant, avec deux bandes transversales ocres de même largeur sur les élytres, la partie médiane comprise entre ces deux bandes est partagée en quatre taches, la couleur ocre s'étendant le long des secteurs, entre les branches du radius et entre le cubitus et le médian, la première tache est allongée et située entre la branche externe du radius et le bord costal, la deuxième, également de forme allongée, se trouve entre la branche interne du radius et le médian, la troisième, petite et qui peut totalement disparaître, se voit entre le médian et le cubitus, enfin la dernière, à bords anterieur et postérieur irréguliers, entre le cubitus et le bord interne.

Longueur: 22 à 23 mm.

Localité: Kabayau (600 ft.) 12 mai, 1929.

Ectemnonotops kiauensis sp. n.

Voisin de *luridifulva* Schm., mais cette espèce n'est représentée dans la collection du Musée de Bruxelles que par un seul exemplaire le type de Schmidt, parmi les cercopides recueillis sur le mont Kinabalu se trouvent 3 ♀ et 1 ♂ qui se distinguent par le coloration foncée des élytres et quelques caractères anatomiques, il serait nécessaire de posséder d'autres échantillons de *luridifulva* type, afin de pouvois décider si ceux-ci ne sont vraiment qu'une variété, ou bien s'ils constituent une nouvelle espèce, la dessication du type ayant pu jouer un role en modifiant certains rapports anatomiques; voici les caractères diffèrentiels: 1°) la coloration des élytres d'un brun-noir brillant, devenant brune sur la partie réticulée, avec la base ocre-brun. 2°) le pronotum plus fortement ponctué. 3°) Le bord externe du vertex au-dessus de l'antenne est très arqué chez le type tandis qu'ici il est presque droit. 4°) La forme du mésosternum, chez *luridifulva* Schmidt, la partie séparant le bord postérieur de la protubérance est presque plane, il est plus oblique chez *kiauensis* et la protubérance est plus inclinée en avant.

Longueur: 22 à 24 mm.

Localités: Kenokok, Kiau.

XI. QUELQUES CERCOPIDES RECUEILLIS AU NORD BORNEO (1927).

Par le Dr. V. LALLEMAND (*Uccle*).

[The species mentioned herein were taken in the lowlands of British North Borneo between June and September, 1927 by Mr. C. Boden Kloss and myself. All the species were found at Bettotan which is about 22 miles west by south of Sandakan, up the Bettotan river which runs into the head of Sandakan Bay:—a cleared, partially cleared, and forested expanse of undulating low country. H. M. Pendlebury.]

Liste des espèces.

Clovia expressa Wlk.
Clovia borneensis Lall. sp. n.
Clovia borneensis var. **sumatrana** Schm.
Clovia bettotana Lall. sp. n.
Euclovia convexa Dist.
Plinia pilosa Dist.
Considia unimaculata Schm.
Eoscarta liternoides Bredd.
Eoscarta flavipes Schm.
Eoscarta pygmaea Schm.
Phymatostetha circumducta Wlk.
P. circumducta var. **borneensis** Btlr
Ectemnonotum buxtoni Btlr.

Descriptions des nouvelles espèces.

Clovia borneensis sp. n.

Front noir, de chaque côté de celui-ci une linge jaune se prolongeant sur le mésosternum; sur le vertex qui est jaune, trois lignes transversales et le bord postérieur noirs, les deux premières lignes n'atteignent pas les bords latéraux, la troisième s'étend d'un oeil à l'autre; pronotum noir traversé par une bande jaune; côtés de l'écusson noirs, sur le milieu une bande jaune s'étendant sur toute la longueur; élytres noirs, devenant jaune-brun en arrière, le long du bord interne depuis la partie postérieure du clavus et le long du tiers postérieur du bord externe; sur la clavus, une bande jaune partant de la base puis se coudant légèrement pour passer sur le corium en se dirigeant vers le milieu du bord externe qu'elle n'atteint pas; sur la partie apical du corium, une bande jaune oblique partant du bord externe et se dirigeant vers l'angle apical, qu'elle n'atteint pas, elle est bordée du côté externe par une fine bande brune; clypeus, premier article du rostre, hanches, pattes, milieu du sternum d'un jaune plus iu moins brunâtre; les tibias antérieurs et l'abdomen sont plus brune; extrémité des épines et des tarses noire.

Longueur: 8 mm.

Habitat: N. Bornéo. Bettotan, nr. Sandakan (3 aout 1927).

Clovia bettotana sp. n.

Partie superieure brun-clair, recouverte d'une villosité dense et rousse; ailes hyalines, légèrement enfumées vers l'extrémité en dehors de la nervure circulaire, face inférieure légèrement plus claire; tarrière, extrémité du rostre et des tarses brun-noir; sur le bord antérieur de la tête, au devant de la partie frontale du vertex une ligne noire. Deux fortes épines sur les tibias postérieurs.

Longueur: 7 mm.

Habitat: N. Borneo, Bettotan, nr. Sandakan (du 22 au 27 Juillet 1927).

XII. QUELQUES CERCOPIDES DE LA PRESQU'ILE MALAISE.

Par le Dr. V. LALLEMAND (*Uccle*).

[Dr. Lallemand has described already several new species etc. from our Malayan collection in Vol. xvi of this *Journal* (1930, pp. 98–107).

The species mentioned below were determined too late for incorporation in that paper. Four of the species (marked*) can be added to the list that follows Dr. Lallemand's paper (*t. c.* pp. 108–118). H. M. Pendlebury.]

Liste des espèces.

***Ptyelus praefractus** Dist.

Malay Penins. West Coast: Langkawi Ids. April, 1928 (H.M.P.)

Plinia marginalis Schmidt.

West Coast: Langkawi Ids. April, 1928, Perak: Taiping; Selangor—Pahang border, The Gap, 2,700 feet; Kedah: Catchment Area near Jitra, April 1928 (H. M. Pendlebury).

Eoscarta punctata Lall.

Selangor: Bukit Kutu.

***Phymatostetha bukitana** Lall. sp. n

Selangor: Bukit Kutu. 19.4.1926 (H. M. Pendlebury).

***Phymatostetha kedahana** Lall. sp. n.

Kedah Peak: 3,300 feet, 1915 (H. C. Robinson & C. Boden Kloss). March, 1928. (H. M. Pendlebury).

Phymatostetha circumducta Wlk.

Kedah Peak.

P. circumducta var. **borneensis** Btlr.

West Coast: Langkawi Ids. April, 1928.

Leptataspis fuscipennis St. Farg. & Serv.

Kedah Peak. Selangor—Pahang border, The Gap, 2,700 feet.

Leptataspis helena Bredd.

Malay Peninsula: No more exact data.

Ectemnonotum apicale Lall.

Selangor—Pahang border: the Gap, 2,700 feet.

Ectemnonotum nigrum Atk.

Kedah Peak:

Suracarta fasciata var. **perakana** Jac.

Selangor—Pahang border: the Gap, 2,700 feet. Perak: Batang Padang, Jor Camp 1,800 feet. Kedah Peak, 3,300 feet. (H. M. Pendlebury).

***Suracarta submaculata** Wlk. var. **flava** Schm.
Kedah Peak.

Descriptions des nouvelles espèces.

Phymatostetha bukitana sp. n.

Très voisin de *P. vicina* Lall., en diffère par la dessin des élytres: la tache coriale située près de la base entre la suture du clavus et la scissure a disparu, mais une autre, également près de la base, se voit le long du bord externe; les trois taches disposées en bande incurvée un peu au-devant du milieu de la longueur sont remplacée par une bande très légèrement ondulée; écusson de coloration variable ocre-jaune avec l'extrémité brun-noir ou avec l'extrémité et les angles latéraux brun-noir ou même pouvant être complètement brun-noir. Longueur: 24 mm.

Habitat: Selangor, Bukit Kutu (19 avril 1926) H. M. Pendlebury.

Phymatostetha kedahana sp. n.

Voisin de *P. circumducta* Stal, et de *cincta* Lall., vertex noir; front brun, bord antérieur de la tête et un long triangle à la base du front, pronotum, écusson et élytres noirs; sont jaunes: une bande le long des bords antérieur et antérolatéraux du pronotum, ainsi que quatre autres sur les élytres, deux transversales et deux longitudinales, dont une le long du bord externe, assez courte, n'atteignant pas la première bande transversale et l'autre au bord interne, s'étendant de la base jusqu'au niveau de la pointe de l'écusson, plus large à la base qu'à son extrémité. Le bord apical des élytres est brun; prosternum noir avec de chaque côté une grande tache noir oblique; méso- et metásternum noirs à taches jaunes. Premier article du rostre, hanches jaunâtres; second article du rostre noir; cuisses jaunàtres montrant le long du bord supérieur une large bande brune; tibias, tarses antérieurs et médians bruns; tibias et tarses postérieurs jaune-brunâtre; épines noires; abdomen jaune, sur chacun de ses segments trois taches noirâtres, une large médiane et deux latérales.

Se distingue de *circumducta* par la longueur de la bande longitudinale externe qui est très courte, alors que chez celle-ci elle s'étend jusque la seconde bande transversale, ainsi que par la couleur des bandes qui sont jaunâtres; chez *cincta* la bordure externe des élytres est réduite à une ligne rougeâtre, les deux bandes transversales sont gordées d'une zone plus foncée que le restant des élytres et la postérieure est plus irrégulière; la base de l'écusson est rouge; pas de tache sur le milieu des segments de l'abdomen.

Longueur: 13 mm.

Habitat: Kedah Peak, 3,300 feet (decembre 1915 H. C. Robinson et C. Boden Kloss. Mars 1928, H. M. Pendlebury).

XIII. DERMAPTERES DE BORNEO.

Par le Dr. Alfredo Borelli,

R. Museo Zoologico di Torino.

(Thirteen text figures).

[Dr. Borelli has reported upon two collections in this paper, one of them was made by Mr. C. Boden Kloss and myself in the lowlands of British North Borneo in 1927, and the other material is the property of the Sarawak Museum, Kuching.

The former collection was made in low-lying country at Bettotan and Samawang which places are about twenty five miles west by north and twenty two miles west by south, respectively, of Sandakan. Kudat is on the north western point of the island.

The localities of the latter collection–which appears to have been brought together by Shelford, Hewitt, Moulton, and Mjöberg–are all in Sarawak, viz:—Kalabit Country, Mt. Dulit, Mt. Poi, Mt. Murud, Mt. Penrissen, Tubau, Miri, Long Mujan, Lio Matu, and Baram River. H. M. Pendlebury.]

PYGIDICRANIDAE.

DIPLATYINAE.

Diplatys nigriceps Kirby.

Kalabit country 3,000 ft.: 1 ♀.

Bettotan, nr. Sandakan, Juillet 3, 1927: 1 ♀.

PYGIDICRANINAE.

Tagalina semperi Dohrn.

Mt. Dulit 3,500 ft.: 1 ♀.

Kalocrania marmoricrura Serv.

Mt. Dulit 3,500 ft.: ♂ et ♀.

Kalabit country 3,000 ft.: 2 ♂.

Bettotan: nr. Sandakan, Juillet 30, 1927: 1 ♀. Août 1927 3 nymphes.

Ces exemplaires diffèrent par la couleur des exemplaires typiques de Java et ressemblent à ceux des îles Philippines. La tête derrière les antennes est presque entièrement jaune, de son bord postérieur noirâtre partent deux lignes de même couleur qui atteignent la suture frontale, du milieu de laquelle se détache une ligne noirâtre qui se confond antérieurement avec le clypeus de même couleur. La tache jaune des élytres se prolonge sur toute leur moitié antérieure et atteint l'angle scapulaire derrière le bord postérieur du pronotum.

Kalocrania celebensis Borm.

Samawang, nr. Sandakan, Juillet 14, 1927: nymphe.

Cranopygia philippinica Burr.

Bettotan, nr. Sandakan, Août 26, 1927: 1 ♂.

Acrania bakeri Borelli.

Bettotan, nr. Sandakan, Août 1927: 1 ♂.

var. fusca var. n.

Tête d'un noir brun avec la partie antérieure du clypeus jaune testacé, palpes maxillaires marrons, testacés à l'extremité. Segments du sternum bruns de poix, le prosternum bordé latéralement de jaune. Hanches, fémurs et moitié basale des tibias de la première paire de pattes, d'un marron noirâtre; 2*e* et 3*e* paire de pattes testacées. Pronotum marron bordé latéralement de jaune pâle, élytres et écusson d'un marron rougeâtre. Ailes jaune paille. Segments de l'abdomen et branches de la pince d'un marron noirâtre.

Bettotan, nr. Sandakan, Août 17, 1927: 1 ♂.

ECHINOSOMATINAE.

Echinosoma horridum Dohrn.

Mt. Murud, October 1903: 2 ♂ 1 ♀ 1 larve.

Bau, 1 ♂.

Kudat, N. Borneo, Septembre 9, 1927: 1 ♂.

Echinosoma sumatranum Haan.

S. Baule, Sarawak, October 1925: 1 ♂ et une larve.

Samawang, nr. Sandakan, Juillet 1927: 1 nymphe ♂.

LABIDURIDAE.

ALLOSTETHINAE.

Allostethella doriae Dubrony.

Mt. Dulit 3,500 ft.: 1 ♀.

Allostethus indicum Hagenb. (Burm.)

Mt. Dulit 3,500 ft.: exemplaires ♀ et larves.

Tutan Baram: ♂.

Long Mujan, Baram River, Sarawak, 1920: ♀ (J. C. Moulton).

var. **minor** Bormans.

Kalabit country 3,000 ft.: ♂.

Mt. Dulit 3,500 ft.: ♀.

var. **brachyptera** var. n.

Mt. Murud 6,000 à 7,000 ft.. Octobre 1903: ♂ et ♀.

Mt. Dulit 3,500 ft.: ♀ et larves.

Mt. Poi: larves.

Paitrop Baram: ♀.

Tous ces exemplaires sont de couleur noirâtre, sauf l'extrémité distale des tibias et les articles des tarses qui sont testacés, ils correspondent sous ce rapport à la *Psalis borneensis* Kirby, forme mélanique de l'*Allostethus indicum*; l'écaille alaire est toutefois complètement cachée, les élytres sont à peine plus longues que le pronotum, qu'elles ne débordent pas latéralement, avec les côtés parallèles et le bord postérieur arrondi et leur taille varie énormément.

PSALINAE.

Gonolabis sumatrana Borm.

Mt. Murud, 6,000–7,000 ft.: 1 ♀.

Gonolabis oblita Burr.

Mt. Poi, 400 ft. (Sarawak) 1 ♀.

Epilandex burri Borelli.

Landex burri Borelli in: Bull. Mus. Hist. Nat. France, 1921 p. 81.

Epilandex burri Borelli in: Morgan Hebard, Proc. Acad. Nat. Science, Philadelphia, Vol. LXXIX, 1927, p. 27.

Samawang, nr. Sandakan, 12 Juillet 1927. 1 ♀.

Euborellia annulipes Luc.

Tubau (Sarawak), Octobre 1925, 2 ♂ juv.

Parapsalis laevis Borelli.

Boll. Mus. Zool. Anat. comp. Torino, Vol. 25, N. 736 (1921).

Bettotan, nr. Sandakan, Août 1927, 1 ♀. Septembre 1927, 1 ♀.

Miri, Sarawak 1 ♀.

Seule espèce connue du genre *Parapsalis*, décrite sur deux exemplaires provenant de Sandakan (Borneo), signalée plus tard des iles Philippines, de Wai Lima (Sumatra) et de Suisharyo (Formosa). Ce dernier exemplaire appartient bien au genre *Parapsalis* et non au genre *Chaetospania*, comme l'a affirmé récemment le Dr. T. Shiraki (1); son armure genitale est semblable à celle de *Parapsalis laevis* Borelli (2). Il pourrait très bien se faire que l'exemplaire provenant de Taihorin (Formosa), décrit par Malcolm Burr sous le nom de *Chaetospania infernalis*, appartînt luimême au genre *Parapsalis*: comme semble l'indiquer la figure donnée par Malcolm Burr.[3]

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(1) T. Shiraki: Demapteren aus Kaiserreich Japan, Ins. Mats., Vol. III, Pt. I, p. 12, Oct. 1928.

(2) *loc. cit.* p. 3, fig. 1.

(3) Entom. Mitt., p. 67 fig. 3 (1913).

LABIDURINAE.

Labidura riparia Pall.

Bettotan nr. Sandakan, 21 VII 1927.

Divers exemplaires ♂ et ♀ de la variété *inermis* Brunn[4].

Nala ornata sp. n. (Figs. 1, 2.)

♂ : Tète d'un brun rougeâtre, un peu plus longue que large, covexe dans la partie frontale, couverte d'une légère pubescence jaune; palpes testacés. Antennes de 25 articles, typiques du genre, testacés, les deux premiers plus foncés.

Pronotum plus étroit que la tête, plus long que large, rectangulaire allant en se retrécissant dans le tiers postérieur; bord antérieur droit, bord postérieur fortement arrondi. Brun avec les bords latéraux liserés de testacé.

Elytres d'un longueur double de celle du pronotum, d'un brun fauve, coriacées. Angles huméraux arrondis, côtés droits et parallèles, fortment carénés sur toute leur longueur, bord postérieur coupé droit.

Ecaille alaire longue comme la moitié de l'elytre, de même couleur et texture. Pattes grêles, testacées. Abdomen faiblement convexe, non ponctué, marron, pubescent; ses bords latéraux subparallèles jusqu' à la base du dernier segment dorsal. Dernier segment ♂ : subrectangulaire, convex en dessus et traversé dans toute sa longeur par un sillon médian, pourvu entre les branches de la pince d'un bourrelet saillant rugueux en forme de court triangle obtus dont la base est flanquée de chaque côté d'une petite protuberance saillante au dessus des branches de la pince. ♀ : dernier segment rétréci en arrière, son bord postérieur grossi et coupé droit, les protubérances latérales plus marqués que chez le ♂, tuberculiformes.

Penultième segment ventral subrectangulaire, presque deux fois plus large que long avec le bord postérieur convexe et fortement arrondi.

Pygidium vertical, non saillant, trapeziforme, présentant au milieu du bord postérieur une petite dent conique; horizontale.

Branches de la pince pubescentes. ♂ : écartées et dilatées à la base et légèrement arquées en dehors, puis plus grêles, pliées en dedans et presque droites jusqu'aux pointes courbées qui s'entrecroisent; munies en dessus d'une caréne granuleuse dans le 1er tiers de leur longueur, puis lisses et

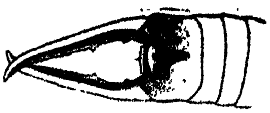

Fig. 1. *Nala ornata* ♂ sp. n.

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(4) This species was attracted to light and was especially abundant on dark nights. They would seize with their forceps any insect that had dropped to the ground below the lamp, and carry it off underground, not however without several challenges and disputes with their fellows. H.M.P.

arrondies. Intérieurement sinueuses dans le premier tiers de leur longueur puis presque droites; leur arête interne présente, inférieurement, à peu de distance de la base une petite dent suivie, à l'extrémité de la sinuosité, d'une dent plus forte. (Fig. 1).

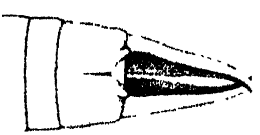


Fig. 2. *Nala ornata* sp. n. ♀

♀ : Branches de la pince presque contigues à la base, triquêtres, leur bord interne droit; allant en s'amincissant graduellement de la base aux pointes courbées et entrecroisées; arête interne fortement crénelée dans la première moitié de leur longueur, puis les branches sont légèrement sinueuses. (Fig. 2).

Longueur du corps, ♂ : 9 mm. 5 ♀ : 12 mm.

Longueur de la pince,: 3 mm. 1 ♀ : mm. 6.

Rock Ro': 1 ♂. Baram Riv., Septembre 1903: 1 ♀.

Espèce voisine de la *Nala tenuicornis* Borm., dont elle diffère par la structure du dernier segment de l'abdomen et par la forme des branches de la pince.

BRACHYLABINAE.

Metisolabis caudelli Burr.

Mt. Dulit 3,500 ft., 2 ♂.

Espèce de Birmanie qui jusqu' à présent n'a pas été signalée de Borneo.

PLATYLABINAE.

Platylabia major Dohrn.

Tutau Baram, 1 ♀.

PARADERMAPTERA.

APACHYDAE.

Apachyus chartaceus Haan.

Bettotan, nr. Sandakan, Août 1927. 1 ♀.

EUDERMAPTERA.

LABIIDAE.

SPONGIPHORINAE.

Apovostox pygidiatus Dubrony. (Fig. 5).

Labia pygidiata Dubrony, Ann. Mus. Civ. Storia Nat. Genova, XIV, p. 364. text-figs. 1879.

Mt. Murud 5,000–6,000 ft. ♂ et ♀.

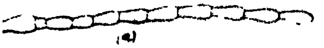
Apovostox stella Borm. (Figs. 3, a, b, 4).

Spongiphora stella Borm., Ann. Mus. Storia Nat. Genova, Vol. XX, p. 454, 1900.

Bettotan, nr. Sandakan, 28 VII, 1897. 2 ♂.

Mt. Penrissen, 4,500 ft., E. Mjöberg. 1 ♂.

Je considère cette espèce comme faisant partie du genre *Apovostox* Hebard, à cause de la forme des articles des antennes cylindriques ou cylindro-coniques du 3*e* au dernier (fig. 3a) de la forme du pronotum dont les côtés sont à peine divergents d'avant en arrière, de celle des branches de la pince déprimées en dessus le long du bord externe et fortement saillantes le long du bord interne (fig. 3,) et surtout à cause de la forme de l'armure génitale (fig. 4) qui est presque semblable à celle de l'*Apovostox pygidiatus* (fig. 5) espèce que Morgan Hébard considère comme type du genre *Apovostox*[5].



(a) antenna

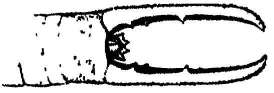


Fig. 3. *Apovostox stella* Borm. ♂

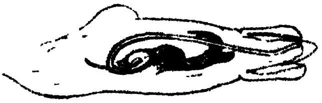


Fig. 4. *Apovostox stella* Borm. Genital armature

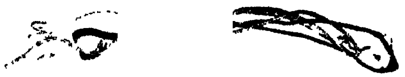


Fig. 5. *Apovostox pygidiatus* (Borm.) genital armature

Apovostox gracilis sp. n. (Figs. 6, 6a, 7).

♂ : Tête d'un brun foncé avec les parties buccales testacées; pentagonale, légèrement convexe entre les yeux, échancrée le long du bord postérieur, sutures indistinctes. Yeux gros, leur diamètre longitudinal d'un tiers supérieur à leur distance du bord postérieur de la tête. Antennes de 15 articles d'un brun testacé, le 3*e* et le 4*e* à peu près de même longueur, cylindriques les suivants coniques s'allongeant et s'amincissant jusqu'aux trois derniers, grêles et de longueur égale au 1*er*.

Pronotum rectangulaire, un peu plus long que large et un peu plus étroit que la tête, les côtés faiblement divergents d'avant en arrière; angles et bord postérieurs arrondis; d'un brun rougeâtre, testacé le long des bords postérieur et latéraux.

Elytres deux fois plus longues que le pronotum, d'un testacé fauve, pubescentes.

Ailes de la longueur du pronotum, d'un brun rougeâtre, pubescentes. Pattes testacées, les fémurs obscurcis de brun; 1*er* article du tarse de longueur égale à la somme du 2*e* et du 3*e*.

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(5) Morgan Hebard: Studies in Sumatran Dermaptera, Proc. Acad. Nat. Sciences, Philadelphia, Vol. LXXIX p. 31.

Abdomen d'un brun marron, luisant. Dernier segment rectangulaire, deux fois et demie moins long que large, déprimé postérieurement et présentant une fossette à peu de distance du bord postérieur, la dépression limitée par un petit tubercule au-dessus de chaque racine de la pince.

Pénultième segment ventral un peu plus large que long, rectangulaire à la base, arrondi dans la moitié postérieure avec le bord postérieur légèrement échancré en son milieu.

Pygidium bombé en dessus et assez étroit à la base puis se dilatant en forme de lame trapezoidale pliée vers le haut dont le bord postérieur est légèrement convexe. (Fig. 6).

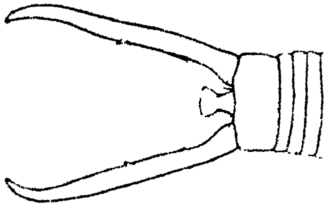

Fig. 6. *Apovostox gracilis* sp. n. ♂

Branches de la pince testacées; écartées à la base, allongées, grêles, convexes en dessus, presque droites et parallèles jusqu'aux pointes courbées en dedans; l'arête interne se dilate légèrement en lame irrégulière dans le quart basal inférieur et présente en dessus une petite dent, vers le milieu de la longueur des branches. (Fig. 6).

6a. *Apovostox gracilis* sp. n. antenna.

Longueur du corps, ♂ : 6 millimètres 7.

Longueur de la pince, ♂ : 2 millimètres 9.

Mt. Poi, Sarawak, 4,300 ft., 1 ♂.

Espèce distincte par la forme du pygidum et de la pince, se rapproche d' *Apovostox stella* par la distribution des couleurs et la forme générale du corps.

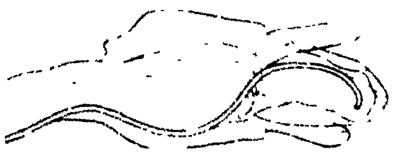

Fig. 7. *Apovostox gracilis* sp. n. genital armature

Armure génitale du type de l'*Apovostox pygidiatus* Dubrony. (Fig. 7).

Pseudovostox bicolor Borelli.

Samawang, nr. Sandakan, 12 Juillet 1927, 1 ♀.

Irdex nitidipennis Borm.

Mt. Dulit 3,500 ft., 1 ♂.

var. **linguiformis** Borelli.

Exemplaire à pygidium en forme de langue, bombé en dessus, arrondi et légèrement convexe en son milieu à l'apex; cette variété a été déjà signalée de Ginting Bidai (Malay peninsule).[6]

Irdex bicuneatus sp. n. (Figs. 8, 9, 10).

♂ : Tête d'un brun noirâtre avec les parties buccales brun testacé, pubescente, pentagonale, un peu plus longue que large, faiblement convexe, déprimée le long du bord postérieur qui est légèrement échancré: yeux gros, de longueur égale à leur distance du bord postérieur de la tête. Antennes de 15 articles, brun testacés, le 4*e* conique, aussi long que le 3*e*, les suivants cylindriques, grêles, s'allongeant graduellement jusqu'aux trois derniers.

Pronotum plus long que large, un peu plus étroit que la tête et de la même couleur, allant en s'élargissant légèrement d'avant en arrière, angles et bord postérieurs arrondis, sa surface médiane bombée en forme de coeur la pointe en arrière; les bords latéraux plats de teinte un peu plus claire.

Elytres d'un marron rougeâtre, pubescentes, de longueur supérieure à deux fois celle du pronotum qu'elles débordent de chaque côté d'un tiers de sa largeur, leur côtés parallèles, bord postérieur coupé droit.

Ailes de longueur peu inférieure à la moitié de celle des élytres, de la même couleur.

Pattes d'un testacé rembruni, les tarses testacés; 1*e* article plus long que le 3*e*.

Abdomen d'un marron ferrugineux, les segments à bords parallèles, coriacés et pubescents. Dernier segment plus foncé, alternativement lisse et luisant, et coriacé et pubescent, presque deux fois aussi large que long, faiblement convexe dans la moitié antérieure, déclive dans la moitié postérieure, déprimé le long du bord postérieur entre les racines de la pince, la dépression limitée de chaque côté par un léger bourrelet.

Penultième segment dorsal, plus de 2 fois plus long que large, quadrangulaire avec le bord et les angles postérieur largement arrondis.

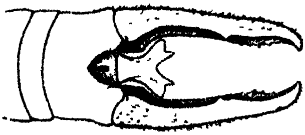

Fig. 8. *Irdex bicuneatus* sp. n. ♂

Pygidium proéminent, rectangulaire à la base, plus long que large, bombé en dessus, pourvu postérieurement de deux lames aplaties, divergentes laissant entre elles une forte échancrure à angle droit, obtusement anguleuses postérieurement, du côté externe, leur angle interne se prolonge en une forte épine conique. (Fig. 8).

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[6] This is being described in the Raffles Museum Bulletin, No. 7, now in the press.

Branches de la pince d'un testacé rougeâtre, pubescentes; robustes et écartées à la base, d'abord faiblement dilatées et légèrement arquées en dehors, puis convergentes et plus minces jusqu'aux pointes courbées en dedans et ne se touchant pas. Bisinueuses en dedans: supérieurement déprimées en dehors, rebordées le long de l'arête interne et pourvues un peu avant le dernier tiers de leur longueur d'une dent triangulaire, inférieurement dilatées en lame convexe en correspondance du pygidium, d'abord mutiques puis légèrement crénelées dans le dernier tiers de leur longueur. (Fig. 8).

♀ : Pygidium quadrangulaire, bombé en dessus à la base déprimé le long du bord postérieur qui est légèrement rebordé et festonné.

Branches de la pince légèrement sinueuses, assez écartées à la base, triquêtres, droites et robustes dans leur premier tiers puis légèrement arquées et s'amincissant jusqu'aux pointes qui se touchent; arête interne dilatée et crénelée dans la première moitié de leur longueur puis mutique. (Fig. 9).

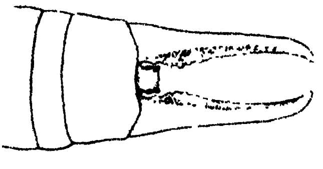

Fig. 9. *Irdex bicuneatus* sp. n. ♀

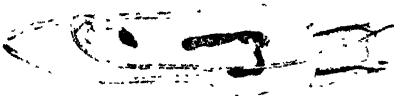

Fig. 10. *Irdex bicuneatus* sp. n. genital armature

Longueur du corps ♂ : 13 mm. ♀ : 10 millimètres.

Longueur de la pince ♂ : 4 mm. 5. ♀ : 2 millimètres.

Mt. Murud, 6,000–7,000 ft. 1 ♂ et 1 ♀.

LABIINAE.

Chaetospania feae Borm.

Mt. Dulit 3,500 ft. 1 ♂ juv., 1 ♀.

Chaetospania thoracica Dohrn.

Mt. Murud 1923. ♂ et ♀ ; Bau, (E. Mjöberg) 1 ♂.

Chaetospania borneensis Dubrony.

Mt. Dulit 3,500 ft. 1 ♂.

Chaetospania minuta Borelli.

Bettotan, nr. Sandakan, 22 Septembre 1927, ♂ et ♀.

Chaetospania gardineri Burr.

Mt. Murud 6,000–7,000 ft., 1 ♂.

Cet exemplaire, sauf la couleur des élytres et des ailes d'un brun ferrugineux, correspond exactement à la description originale de Malcolm Burr, faite sur des exemplaires rencontrés aux îles Seychelles.

Chaetospania bilobata sp. n. (Figs. 11, 12, 13).

Tête brun rougeâtre, parties buccales et antennes de 12 articles typiques d'un testacé fauve, sauf le 1*er* articles brun; assez plate, aussi longue que large, échancrée le long du bord postérieur.

Pronotum plus long que large, plus étroit et à peu près de même longueur que la tête, rétréci antérieurement, rectangulaire avec les angles postérieurs faiblement arrondis; d'un fauve testacé, plus clair le long des bords latéraux et postérieur.

Elytres d'un brun fauve avec reflets métalliques, coriacées et légèrement pointillées; longues une fois et demie comme le pronotum qu'elles débordent de chaque côté du tiers de sa largeur, angles huméraux arrondis, côtés parallèles, bord postérieur coupé droit.

Ailes saillantes de la longueur du pronotum, de même couleur et structure que les élytres. Pattes testacées. Segments de l'abdomen d'un testacé ferrugineux, coriacés et pubescents; à côtés parallèles. Plis tuberculiformes des 3*e* et 4*e* segments peu accusés. Dernier segment dorsal rectangulaire deux fois plus large que long, présentant une faible depression médiane le long du bord postérieur et un tubercule peu marqué au-dessus de chaque racine de la pince.

Pénultième segment ventral grand, presque carré avec les angles et le bord postérieur légèrement arrondis.

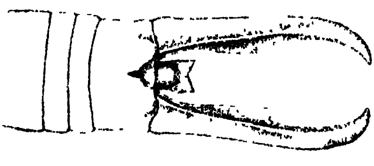

Fig. 11. *Chaetospania bilobata* sp. n. ♂

Pygidium ♂ en forme de lame étroite, rectangulaire, bien saillante, bombé en dessus avec les côtés légèrement convexes, déclive à l'extrémité avec l'apex profondement échancré et pourvu de chaque côté d'une petite dent triangulaire. (Fig. 11).

Branches de la pince d'un brun rougeâtre, pubescentes; écartées à la base, triquêtres, presque droites et parallèles dans les deux premiers tiers de leur longeur puis courbées en dedans jusqu'aux pointes qui se rencontrent; l'arête interne se dilate, de la base presque sur deux tiers de sa longueur, en une lame mince dont le bord interne est légèrement convexe et se prolonge en une épine plate dont la pointe regarde l'apex.

♀ : Pygidium en forme de lame rectangulaire convexe en dessus, comme chez le ♂ mais avec l'apex faiblement échancré et les angles postérieurs peu accentués. (Fig. 12).

Branches de la pince allongées, triquêtres, presque droites, arquées en dedans près des pointes qui se touchent; leur arête interne se dilate en une lame mince, peu saillante dans le tiers basal elle va ensuite augmentant d'ampleur, avec le bord interne convexe et irrégulièrement dentelé, et se perd à peu de distance des pointes. (Fig.12).

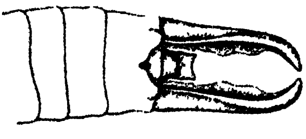

Fig. 12. *Chaetospania bilobata* sp. n. ♀

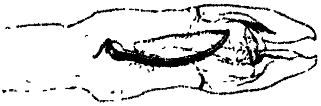

Fig. 13. *Chaetospania bilobata* sp. n. genitalia

Mt. Dulit, 3,500 ft. ♂.

Mt. Murud 1923, ♂ et ♀.

Longueur du corps, ♂ : 8 mm. ♀ : 7 millimètres.

Longueur de la pince, ♂ : 2 mm. 5. ♀ : 2 millimètres.

Espèce distincte par la forme du pygidium du ♂ qui rappelle celui de *Chaetospania foliata* Burr dont elle se distingue par la forme de la pince semblable à celle de *Chaetospania nigriceps* Kirby.

Labia pilicornis Motsch.

Bettotan, nr. Sandakan, 3 Août 1927. ♂ et ♀.

Kudat, N. Borneo, Août 1927, 1 ♀.

Labia curvicauda Motsch.

Bettotan, nr. Sandakan, Septembre 1927, divers ♂ et ♀.

Mt. Murud ♂, Bau ♀.

Labia mucronata Stål.

Bettotan, nr. Sandakan, 2 Août 1928 ♀.

CHELISOCHINAE.

Proreus simulans Stål.

N. Borneo, Kudat, 17 Septembre 1927. 2 ♀, ♂ et ♀.

Baram, Sarawak, Janvier 1920 (J. C. Moulton) ♂.

Bettotan nr. Sandakan, 24 I 1927, 1 ♀.

Kalabit Country. 3,000′, 1 ♀.

Proreus ritsemae Borm.

Mt. Dulit, 3,500 ft. 3 ♂ et 2 ♀.

Mt. Murud foot, 1923. 1 ♀.

Proreus delicatulus Burr.
Kalabit Country, 3,000′, 1 ♀.
Bettotan, nr. Sandakan, 19 Août 1927. 1 ♀.
Chelisoches morio Fabr.
N. Borneo, Sandakan, 20 Juillet 1927: ♂.
Bintulu, Sarawak, Octobre 1925: ♂.
Hamaxas feae Borm.
Bettotan. nr. Sandakan, 15 Août 1927: 5 ♂ et 5 ♀ de la forme *cyclolabia*;
1 ♂ et 3 ♀ de la forme typique *macrolabia*.

FORFICULIDAE.

ANECHURINAE.

Allodahlia coriacea Borm.
Bettotan, nr. Sandakan, 3 Août 1927. 1 ♀.
Allodahlia scabriuscula (Serv.).
Mt. Murud, Sarawak, 4 Décembre 1914. ♀.

OPISTHOCOSMIINAE.

Opisthocosmia centurio Dohrn.
Mt. Dulit: ♂ ♀.
Leo Matu: ♂ ♀.
Cordax forcipatus Haan.
Mt. Dulit, 3,500 ft., ♂ et ♀.
Leo Matu, ♂.
Marei, Parei 5,000 IV 1929: (Mt. Kinabalu, B. N. Borneo).

Exemplaires d'un brun noirâtre; ceux du Mt. Dulit manquent de tache jaune près de l'angle huméral des élytres, tandis qu'elle est bien marquée chez celui de Leo Matu et de Marei Parei.

XIV. DERMAPTERES DU MT. KINABALU (B. N. BORNEO).

Par le DR. ALFREDO BORELLI.
R. Museo Zoologico di Torino.

(Avec huit figures).

Les Dermapteres indiqués ci-dessous ont été recueillis du Mt. Kinabalu (B. N. Borneo) pendant mars, avril, et mai 1929, par Mr. H. M. Pendlebury de Kuala Lumpur, F.M.S.

PYGIDICRANIDAE.

PYGIDICRANINAE.

Cranopygia cumingi (Dohrn).

Lumu Lumu, 5,500 ft., 16 IV 1929.

Un exemplaire ♀ privé d'écailles alaires.

LABIDURIDAE.

ALLOSTETHINAE.

Allostethus indicum (Burm.).

Kiau 3,000, Avril 4. 1929: 1 ♂.

Var. **brachyptera** Borelli.

Lumu Lumu, Avril 1929: 1 ♂, 4 ♀ et larves.

Exemplaires de couleur noirâtre, correspondant comme ceux des autres localités de Bornéo, à la forme privée d'ailes de la variété mélanique décrite par Kirby sous le nom de *Psalis borneensis*.

PSALINAE.

Mongolabis aberrans sp. n. (Figs. 1, 2).

♂ : Tête plus longue que large, modérément bombée, presque lisse avec quelques points enfoncés; d'un noir de poix avec la lèvre supérieure testacée et les palpes et le clypeus brun testacés. Sutures postfrontale et médio occipitale bien distinctes. Antennes de 14 articles d'un brun ferrugineux, pubescents: le 4*e* subovale, de moitié plus court que le 3*e*, le 5*e* un peu plus court que le 3*e*, le 6*e* à peine plus long, les suivants grêles, cylindro coniques, s'allongeant insensiblement jusqu'au dernier.

Pronotum subrectangulaire, à peine plus étroit que la tête en avant, un peu plus large en arrière, tous ses bords droits, angles postérieurs très brièvement arrondis; sa surface légèrement convexe est divisée dans les deux premiers tiers de sa longueur par un fin sillon médian. Brun de poix, passant au testacé dans la partie médiane, luisant, ses bords latéraux faiblement relevés, d'un testacé ferrugineux.

Mesonotum et metanotum de la couleur du pronotum, luisants. Pattes d'un testacé obscur, la partie distale des fémurs et des tibias ainsi que les tarses, plus pâles; 1*er* article des tarses de longueur supérieure à la somme du 2*e* et du 3*e*.

Segments de l'abdomen d'un brun de poix, rougeâtres le long du bord postérieur, très finement ponctués et pubescents; se dilatant du 1*er* au 6*e*, allant en se rétrécissant faiblement du 7*e* au dernier dont la largeur est d'un tiers supérieure à celle du métanotum. Plis tuberculiformes des 3*e* et 4*e* segments à peine distincts. Les segments à partir du 5*e*, sauf le dernier, sont anguleux et carénés sur les côtés et se terminent postérieurement en pointe aigüe et recourbée. Dernier segment rectangulaire, deux fois plus large que long, ponctué, fortement rebordé et rugueux postérieurement, présentant un sillon médian plus profond en arrière qu'en avant, de chaque côté duquel se trouve, le long du bord postérieur, une forte dépression à bords pliciformes au-dessus de chaque racine de la pince. Les bords latéraux du dernier segment sont munis d'un fort repli tuberculeux et, l'espace compris entre ces replis et ceux qui surmontent les racines de la pince est fortement déprimé.

Pygidium vertical non saillant, faiblement trapezoidal, creusé en dessus avec les côtés latèraux rebordés et légèrement saillants de chaque côté du bord postérieur.

Pénultième segment ventral arrondi dans la moitié postérieure, grossièrement ponctué et rugueux, couvert de longs poils jaunâtres.

Branches de la pince d'un brun de poix, grossièrement ponctuées; asymétriques, dilatées à la base et largement aplaties du côté extérieur, triquêtres dans le premier tiers de leur longueur, puis cylindriques; la branche droite courbée en demi cercle en dedans, présente intérieurement près de la base, comme prolongement de la dilatation, une forte dent conique; la branche gauche inerme presque droite, légèrement sinueuse, la pointe seule courbée en dedans. (Fig. 1).

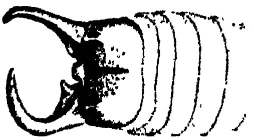

Fig. 1. *Mongolabis aberrans* sp. n. ♂

♀ : Segments 5 à 9 de l'abdomen prolongés postérieurement en pointe obtuse, dépourvus de caréne. Dernier segment luisant, parsemé de quelques gros points, trapézoidal, allant en se rétrécissant dans la moitié postérieure, faiblement convexe et divisé par un profond sillon médian longitudinal; bord postérieur non rebordé, légèrement

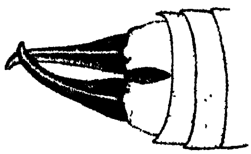

Fig. 2. *Mongolabis aberrans* sp. n. ♀

concave entre les racines de la pince, la concavité limitée par deux petits tubercules correspondant à l'arête médiane des branches de la pince. (Fig. 2). Pygidium conique peu apparent.

Branches de la pince robustes à la base et triquêtres dans le premier tiers, puis cylindriques allant en s'amincissant jusqu'aux pointes; presque droites, légèrement sinueuses, les pointes courbées en dedans et entrecroisées.

Longueur du corps ♂ : 14–16. 5 millimètres ♀ : 12–14. 4 mill.

Longueur de la pince ♂ : à gauche 3–3. 5 mill., à droite 2.4–2.9 mill.

Longueur de la pince ♀ : à gauche 3–3.4 mill., à droite 2.5–2.9 mill.

Plusieurs exemplaires ♂ et ♀ de Pakka, 10,200 ft., Mars 1929.

2 exemplaires ♀ de Kamborangah, 7,200 ft., Avril 1929.

Les exemplaires ♂ correspondent presque exactement à la description de *Gonolabis verhoeffi* Burr faite sur un exemplaire provenant du sud de l'Australie et qui, d'aprés Malcolm Burr,[1] est le de *Mongolabis brünneri* (Dohrn), espèce signalée de l'Australie dont on ne connaissait que la ♀ ; ils en diffèrent par la ponctuation et la rugosité des segments de l'abdomen qui en outre vont en se rétrécissant plus fortement du 5e au dernier dans *Monglolabis aberrans*.

var. **inermis** var. n.

Couleur plus foncée que dans les exemplaires typiques. Branches de la pince dilatées à la base, mais la branche droite manque de dent et est moins fortement courbée que dans les exemplaires typiques, en outre la taille des exemplaires de cette variété est moins grande, les segments de l'abdomen sont moins rugueux, leurs carènes sont moins accentuées et les segments intermédiares sont moins dilatés. Pakka 10, 200 ft., 23 Mars 1929, 2 ♂.

Longueur du corps ♂ : 12 millimètres.

Longueur de la pince ♂ : à gauche 2.1 à droite 1.8 milimètres.

Les exemplaires de la variété *inermis* correspondent à la description donnée par Malcolm Burr d'un exemplaire provenant de Port Denison[2] (Nord Australia) que cet auteur considère comme un exemplaire ♂ de *Mongolabis pacifica* (Erichson). Je ne crois pas que ces exemplaires puissent être séparés spécifiquement de *Mongolabis aberrans* dont ils ne sont qu'une variété · dimorphisme commun dans le genre *Mongolabis* et qui a été signalé par Malcolm Burr dans les espèces *Mongolabis Woodwardi* Burr et *Mongolabis Michaelsini* Burr, dont la forme typique est dépourvue de dent à la base de la pince et qui présentent chacune une variété *dentata.*[3]

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[1] Malcolm Burr: Ann. K.K. Hofmus. Wien, 1912, p. 74.

[2] *loc. cit.* p. 75.

LABIIDAE.

NESOGASTRINAE.

Nesogaster intermedius sp. n. (Fig. 3).

Tête rougeâtre avec les parties buccales testacées; bombée, sutures indistinctes. Antennes de 13 articles, les 4 premiers testacés, du 5*e* au 10*e* brun, les 2 suivants blanchâtres, le dernier brun.

Pronotum rectangulaire d'un noir brillant, jaune le long des bords latéraux.

Elytres d'un noir brillant, jaunes le long des angles huméraux; longs une fois et demie le pronotum qu'ils débordent à peine, côtés parallèles, bord postérieur droit.

Ailes nulles.

Pattes: fémurs noirâtres, jaune à l'apex; tibias jaunes, ceux de la 1*ere* paire noirâtre à la base; tarses jaunes.

Abdomen d'un marron foncé; plis tuberculaires du 4*e* segment bien marqués, d'un jaune orangé.

Pygidium noirâtre, proéminent, convexe en dessus, rectangulaire avec le bord postérieur saillant en forme de triangle dont le sommet est prolongé en lame rectangulaire, assez courte et étroite. (Fig. 3).

Branches de la pince noirâtres, rougeâtres à la base; allongées, droites et presque parallèles dans les deux premiers tiers de leur longueur, puis faiblement courbées en dedans et allant en s'amincissant jusqu'aux pointes. Triquêtres, légèrement dilatée en dedans et finement dentelées dans le 1*er* tiers de leur longueur, ou elles sont pourvues d'une forte dent conique, puis plus grêles et arrondies. (Fig. 3).

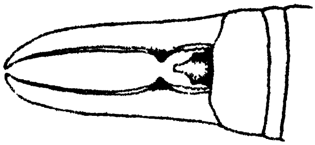

Fig. 3. *Nesogaster intermedius* sp. n. ♂

Longueur du corps ♂ : 6 millimètres 5.

Longueur de la pince ♂ : 2 millimètres 6.

1 ♂ de Kabayau, 600 ft., 12-V-1929.

Espèce voisine de *Nesogaster amoenus* Stal dont elle diffère par la forme caractèristique du pygidium, elle a aussi beaucoup d'analogie avec *Nesogaster gonopygius*

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[3] Malcolm Burr: Die fauna Sudwest Australiens. Dermaptera, 1908, pp. 73, 76; Tav. XI, fig. 1 et 2 a, b,; 4 et 5 a, b.

Borelli des îles Mentawei qui peut être n'est, comme *Nesogaster intermedius*, qu'une variété de *Nesogaster amoenus* Stal.

SPONGOPHORINAE.

Apovostox pygidiatus Dubrony.

Kinabalu, Kabayau, 600, 14-III-1929. 1 ♂.

Irdex bicuneatus Borelli.

Lumu Lumu, 5,500 ft. 11-IV 1929—Plusieurs exemplaires ♂ et ♀.

forme **macrolabia** n. (Fig. 4).

Pygidium long et convexe en dessus à la base, se dilatant au sommet en deux lames moins divergentes que dans la forme typique, qui se prolongent, côté interne, en une longue épine conique et sont obtusément anguleuses presque arrondies, du côté externe.

Branches de la pince plus allongées que dans la forme typique, pourvues supérieurement, au bord interne, de deux dents dont l'une, plus petite, aux deux cinquièmes de la longueur des branches et l'autre aux trois cinquièmes. (Fig. 4).

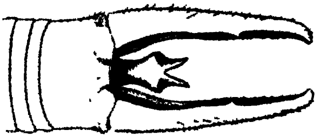

Fig. 4. *Irdex bicuneatus macrolabia* f. n. ♂

Longueur du corps ♂ : 13 millimètres.

Longueur de la pince ♂ : 5 millimètres.

forme **cyclolabia** n. (Fig. 5).

Pygidium globuleux et assez étroit à la base, s'aplatissant et se dilatant de chaque côté à l'apex, en un long lobe horizontal, fogliforme et se prolongeant postérieurement, en son milieu, en deux courtes épines coniques séparées par une faible échancrure.

Branches de la pince plus courtes que dans la forme typique, fortement arquées en dehors dan les deux premiers tiers de leur longueur; l'épine du bord supérieur interne est précédée de quelques petites dents et, la crénelure de l'extrémité du bord inférieur, est elle même précédée d'une petite dent. (Fig. 5).

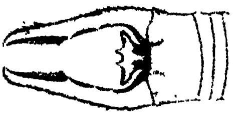

Fig. 5. *Irdex bicuneatus cyclolabia* f. n. ♂

Longueur du corps 11 millimètres.

Longueur de la pince 3 millimètres 7.

Irdex nitidipennis Borm.

Marei Parei 5,000, 2-V-1929. 1 ♀.

Lumu Lumu 13-IV-1929. 1 ♀.

LABIINAE.

Chaetospania bilobata Borelli.

Kenokok 23 Avril 1929, ♂ et ♀.

Ces exemplaires diffèrent des exemplaires typiques provenant de Mt. Dulit et Mt. Murud par leur couleur; ils sont entièrement noirs de poix à l'exception des parties buccales brun de poix et des pattes, d'un brun de poix grisâtre ou olivâtre.

Tenompok, Pass. 4,200, 18-III-1929. 2 ♂.

Lumu Lumu, 5,500 ft., 15-IV-1929. 1 ♀.

Ces exemplaires sont aussi de couleur plus foncée que les exemplaires typiques: tête, pronotum, élytres et écailles alaires noir de poix; parties buccales, antennes, segments de l'abdomen pygidium et branches de la pince d'un brun rougeâtre, pattes d'un jaune d'ochre. En outre les exemplaires ♂ ont le pygidium plus dilaté sur les côtés, de forme presque ovale avec l'apex légèrement échancré et pourvu de chaque côté d'une dent peu accusée et presque obtuse.

Labia curvicauda Motsch.

Lumu Lumu, 5,500 ft., 15-IV-1929. 1 ♀.

Labia karnyi Borelli.

Kiau, 3,000 ft., 2-V-1929. 1 ♀.

CHELISOCHIDAE.

CHELISOCHINAE.

Chelisoches morio Fabricius.

Kiau, 3,000 ft., Avril 1929. Divers exemplaires ♂ ♀ et larves.

Tous ces exemplaires appartiennent au type à branches de la pince allongées; déprimées et dilatées à la base chez le ♂, avec l'arête interne denticulée, puis cylindriques, courbées en ovale avec les pointes qui, se touchent, l'arête interne présente un certain nombre de petites dents, dont la dernière, plus grosse, après le deuxième tiers de la longueur des branches. Ces exemplaires sont d'un noir mat à l'exception des tarses testacés, et de deux ou trois articles terminaux des antennes blanchâtres; la plupart d'entre eux ont les élytres et les écailles alaires couleur terre d'ombre brûlée.

Proreus simulans Stal.

Kabayau, 600, 12-V-1929. 1 ♀.

FORFICULIDAE.

Lipodes filiformis sp. n. (Figs. 6, 7, 8).

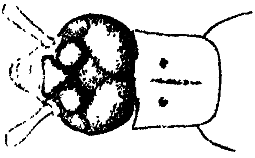

Fig. 6. *Lipodes filiformis* sp. n. ♂

♂ : Tête d'un fauve cannelle, grande aussi longue que sa plus grande largeur mesurée derrière les yeux; bombée, le front divisé par la suture préfrontale en une partie antérieure triangulaire et deux parties latérales convexo-arrondies, sutures post-frontale et médio-occipitale profondes, occiput divisé en deux lobes convexes. (Fig. 6). Antennes de 12 articles, longs, grêles, cylindriques: le 4*e* d'un quart plus long que le 3*e*, les suivants s'allongeant graduellement jusqu'au 9*e* qui a la longueur du 1*er*, les derniers trés grêles; d'un fauve testacé, le 1*er* plus foncé.

Pronotum d'un brun rougeâtre un peu plus étroit que la tête et à peu près aussi long que large; ses angles antérieurs aigus et proéminents, son bord antérieur droit, ses bords latéraux légèrement convexes et bien relevés, d'un testacé pâle, son bord postérieur très faiblement arrondi; sa surface convexe dans les deux tiers antérieurs est divisée par un profond sillon longitudinal flanqué de deux points enfoncés.

Elytres d'un brun ferrugineux, chagrinées; longues une fois et demie comme le pronotum qu'elles débordent à peine avec leurs angles huméraux arrondis, côtés parallèles pourvus sur toute leur longueur d'une carène bien marquée, bord postérieur coupé droit. Ailes nulles.

Pattes testacées, la moitié apicale des fémurs rembrunie; 1*er* article des tarses de longueur peu supérieure au 3*e*, inférieure à la somme du 2*e* et du 3*e*.

Abdomen d'un brun marron, légèrement pointillé; les segments s'élargissant faiblement du 2*e* au 6*e* puis allant en ce rétrécissant jusqu'au dernier dont la largeur antérieure est égale à celle du 2*e*; plis tuberculaires distincts sur le 3*e* segment, très accentués sur le 4*e*. Dernier segment dorsal lisse, faiblement trapezoidal, à peine plus large à la base qu'à l'apex, de longueur inférieure à sa largeur mesurée le long du bord postérieur; bombé déclive d'avant en arrière, légèrement déprimé en son milieu et présentant une fossette ovale à peu de distance du bord postérieur, la dépression limitée de chaque côté par une faible protubérance tuberculiforme correspondant à la base des branches de la pince. Bord postérieur rebordé et coupé droit.

Pénultième segment ventral un peu plus large que long, fortement arrondi dans la moitié postérieure.

Pygidium semi-elliptique, bombé en dessus, son bord postérieur échancré et pourvu de chaque côté d'un lobe en triangle émoussé (Fig. 7).

Branches de la pince jaunâtres, séparées à la base par le pygidium, longues et grêles, cylindriques allant en s'amincissant légèrement de la base aux pointes aigües; presque droites, légèrement arquées et pliées en dedans à peu de distance des pointes qui s'entrecroisent. Leur bord interne, d'abord irrégulièrement crénelé, présente en dessus une petite dent, vers le cinquième de leur longueur, suivie d'une autre un peu aprés le premier tiers. (Fig. 7).

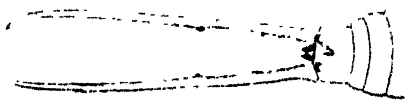

Fig. 7. *Lipodes filiformis* sp. n. ♂

♀ : Pygidium globuleux peu apparent.

Branches de la pince subcontigues; grêles, allongées, triquétro-arrondies, allant en s'amincissant de la base aux pointes aigües; droites et parallèles, faiblement arquées à peu de distance des pointes pliées en dedans et entrecroisées. Bord interne légèrement dentelé de la base aux deux tiers de leur longueur puis lisse. (Fig. 8).

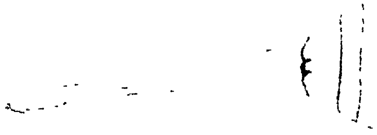

Fig. 8. *Lipodes filiformis* sp. n. ♀

Longueur du corps ♂ : 10.5–11.8 millimètres ♀ : 12 millimètres.

Longueur de la pince ♂ : 7.5–10 millimètres ♀ : 6–7 mill. Lumu Lumu, Avril 1929: 2 ♂ et 3 ♀.

Ces exemplaires correspondent en grande partie à la description d'*Opisthocosmia vivax* Burr. type du genre *Lipodes*[4] Burr. Ils en diffèrent principalement par la structure des élytres chagrinées et non granuleuses et par la gracilité de leur forme, caractère qui pourrait les faire rapporter au genre *Obelura* Burr, mais à cause de leurs élytres complétement développés et de la forme de leur dernier segment dorsal, d'un tiers moins long que large, ils ne peuvent appartenir à ce dernier genre.

OPISTHOCOSMIINAE.

Emboros pendleburyi sp. n.

♂ : Tête bombée, le vertex nettement séparé de la partie occipitale par un profond sillon, suture médio occipitale bien marquée, deux points enfoncés entre les antennes; vertex d'un brun rougeâtre, partie occipitale noirâtre. Antennes de 10 articles, noirâtres sauf le 7*e* blanchâtre; le 1*er* claviforme, très long, les suivants cylindriques, grêles, le 3*e* long comme la moitié du 1*er*, le 4*e* d'un quart plus long que le 3*e*, le 5*e* sensiblement plus long que le 4*e*, les suivants à peu près de même longueur que le 1*er*.

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[4] Malcolm Burr: Trans. Ent. Soc. London, 1907 p. 100.

Pronotum un peu plus étroit que la tête, un peu plus long que large, ses côté convergents, son bord postérieur fortement arrondi; convexe en dessus, traversé par un sillon longitudinal bien marqué avec 2 points enfoncés près de la base; angles antérieurs aigus, bords latéraux convergents et bien relevés, angles et bords postérieur fortement arrondis; noirâtre, testacé le long des bords latéraux.

Elytres d'un brun ferrugineux, coriacées; de longueur supérieure au double de celle du pronotum qu'elles débordent de chaque côté de plus de la moitié de sa largeur, côtés parallèles pourvus sur toute leur longueur d'une carène bien marquée, bord postérieur droit.

Ailes un peu plus longues que le pronotum, brunes avec une grande tache jaune basale et un point jaune à l'angle suturo-apical.

Pattes d'un testacé grisâtre les fémurs rembrunis; 1*er* article des tarses à peine plus long que le 3*e*.

Segments de l'abdomen d'un marron foncé finement pointillés, se dilatant légèrement du 1*er* au 6e puis se rétrécissant jusqu'au dernier, 8*e* et 9*e* segments prolongés postérieurement, sur les côtés, en angle obtus et fournis d'un petit tubercule· plis tuberculaires peu marqués sur le 3*e* segment, très accentués sur le 4*e*. Dernier segment dorsal faiblement trapezoidal, d'un tiers moins long que large, sa longueur égale à sa largeur mesurée le long du bord postérieur, déclive d'avant en arrière et présentant deux faibles proéminences tuberculiformes le long du bord postérieur, celui-ci rebordé et faiblement convexe.

Penultième segment ventral transversal, fortement arrondi dans la moitié postérieure.

Pygidium globuleux, à peine distinct.

Branches de la pince d'un brun rougeâtre, testacées à l'apex. Triquétro arrondies, subcontigües à la base, courbées vers le haut et finement dentelées le long du bord interne dans le 1*er* tiers de leur longueur, à ce point elles présentent en dessus une longue dent verticale, cylindrique à pointe aigue, puis elles divergent et sont ensuite arquées en ellipse; leur arête interne d'abord dilatée et fortement denticulée à la suite de l'épine verticale, va en se rétrécissant et les branches deviennent subcylindriques jusque prés de l'apex; là elles sont épaissies, renflées en dehors, présentent en dedans une petite épine suivie d'une échancrure et terminent en pointe aigue et crochue.

Longueur du corps ♂ : 13 millimètre 5.

Longueur de la pince ♂ : 8 millimètres 7.

1 exemplaire ♂ de Tenompok Pass. 4,200 ft., 18-III-1929.

Espèce qui par la forme des segments de l'abdomen et des branches de la pince rappelle *Cosmiella rebus* Burr et *Narberia beccarii* Borm.; mais à cause de la forme du pronotum plus long que large, rétréci et arrondi postérieurement et de la présence d'élytres dévelopées et carénées sur toute leur longueur elle ne peut être comprise ni dans le genre *Cosmiella* ni dans le genre *Narberia*, elle se rapproche davantage du genre *Emboros*[5] genre d'ailleurs peu connu, auquel elle peut être provisoirement rapportée malgré la présence d'écailles alaires et sa taille plus grande.

Opisthocosmia centurio (Haan).

♂ de Kabayau, 600 ft., près de Kinabalu., 12-V-1929, leg. H. M. Pendlebury.

Opisthocosmia longipes (Haan).

♂ et ♀ de Kabayau, 600 ft., près de Mt. Kinabalu 12-V-1929. H. M. Pendlebury. leg.

♂ de Kiau 3,000 ft. H. M. Pendlebury leg., 29-III-1929.

Pareparchus cruentatus Burr.

Kiau, 3,000 ft., 8-IV-1929 2 ♀.

Timomenus vicinus Burr.

♀ : Kiau 3,000 ft., Mt. Kinabalu, 31-III-1929 (H. M. Pendlebury).

Narberia tuberculata Borelli.

Bull. Mus. d' Hist. Nat. France, 1921. N 1 et 2.

Lumu Lumu, 5,500 ft., IV 1929, 1 ♂ 2 ♀.

Espèce distincte par la présence de carènes granuleuses et de petits tubercules sur les côtés des segments 6 à 10 de l'abdomen et, par la forme de la pince qui rappelle l' *Eparchus oberthuri* Borelli et l'*Eparchus inermis* Hebard.

Les trois exemplaires de Lumu Lumu correspondent à la description originale faite sur des exemplaires provenant de Kouy-Tchéou mais leur couleur est beaucoup plus foncée.

Tête, pronotum et fémurs d'un noir brillant; articles des antennes d'un brun noirâtre sauf le 1*er* d'un noir brillant et le 9*e* et le 10 *e* en totalité ou en partie blanchâtres. Elytres et ailes d'un brun chocolat, ces dernières ornées à la base et à l'apex interne d'une petite tache jaune plus ou moins distincte, pubescentes et légèrement rugueuses. Segments de l'abdomen d'un brun noirâtre; branches de la pince

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[5] Malcolm Burr: Trans. Ent. Soc. London, 1907 p. 103.

d'un brun rougeâtre, testacées à l'apex. Tibias et tarses d'un brun testacé. L'espèce ayant été décrite sur des exemplaires jeunes dont la couleur claire, d'un roux fauve, plus foncée d'ailleurs sur la tête, le pronotum et les segments de l'abdomen, est probablement dûe à une mue récente, je ne crois pas que cette diffèrence de couleur soit suffisante pour séparer spécifiquement les exemplaires de Bornéo de ceux de Kouy-Tchéou.

Longueur du corps ♂ : 11 millimètres 6. ♀ : 12 millim. 4.

Longueur de la pince ♂ : 6 millim. ♀ : 4 millim. 8.

var. **parallela** n.

1 ♂ dont les branches de la pince subcontigües et subcylindriques sont droites et parallèles jusqu'aux pointes légèrement courbées en dedans qui se rencontrent; leur arête interne légèrement dentelée présente une petite dent à peu de distance de l'apex. Exemplaire de couleur foncée, de taille plus grande que les exemplaires typiques.

Longueur du corps ♂ : 15 millimètres.

Longueur de la pince ♂ : 7 millimètres.

1 ♂ de Lumu Lumu, IV 1929.

var. **recurva** n.

1 ♂ dont les branches de la pince subcontigües se courbent légèrement vers le haut dans la première moitié de leur longueur puis se plient vers le bas, formant dans leur seconde moitié un arc peu accentué. L'arête interne légèrement dentelée sur toute leur longueur est dépourvue de dent à peu de distance de l'apex.

Exemplaire de couleur foncée et de taille plus grande que les exemplaires typiques.

Longueur du corps ♂ : 11 millimètres 5.

Longueur de la pince ♂ : 8 millimètres 7.

1 ♂ de Marei Parei 5,000 ft., IV 1929.

var. **sinuosa** n.

1 ♂ dont les branches de la pince subcontigües à la base, se courbent fortement vers le haut dans la première moitié de leur longueur, se rapprochent et deviennent contigües puis se courbent en arc vers le bas, divergent et s'amincissent laissant entre elles un long et étroit espace vide jusqu' au dernier quart de leur longueur, là elles se dilatent faiblement, présentent une petite dent et se courbent de nouveau vers le haut et en dedans jusqu'aux pointes qui s'entrecroisent. Arête interne finement et irrégulièrement denticulée de la base à la dilatation apicale.

Longueur du corps ♂ : 14 millimètres 3.

Longueur de la pince ♂ : 7 millimètres 4.

1 ♂ et 1 ♀ de Kenokok, 3,300 ft. IV 1929.

Exemplaires de couleur foncée et de taille plus grande que les exemplaires typiques; la forme de la pince de l'exemplaire ♂ rappelle celle de l'*Eparchus dux* Borm.

Cordax forcipatus (Haan).

Kenokok, 3,300, 23-IV-29. 1 ♂: exemplaire de forme typique mais avec élytres et ailes noirâtres, unicolores sans taches.

Marei Parei, 5,000, 28-IV-29. 1 ♂: exemplaire de forme typique, élytres et ailes d'un brun noirâtre, ornées de taches orangées à l'angle huméral des élytres à la base et à l'apex interne de l'écaille alaire.

XV. ACRIDIIDAE (ORTHOPTERA) COLLECTED ON MT. KINABALU BRITISH NORTH BORNEO.

By N. C. E. MILLER *F. E. S.*

(With three text figures.).

The Acridiidae in the following list, which includes three new species, form part of a collection made by Mr. H. M. Pendlebury, of the Selangor Museum, during an expedition to Mt. Kinabalu, British North Borneo, in April and May 1929.

The altitudes of the localities in which the collection under consideration was made, are as follows—
Kabayau 600 ft., Koung-Kabayau 1000 ft., Kiau 3,000 ft., Kenokok 3,300 ft., Lobang 4,000 ft., Tenompok 4,700 ft., Lumu Lumu 5,500 ft.

The Tetriginae and Eumastacinae captured in these localities (and including some specimens of the latter from 7,200 feet) are not included in the present paper.

ACRIDINAE.

Phloeoba unicolor Bol.

13 ♀ s Kiau, 3 ♀ s Kabayau, 2 ♀ s Koung-Kabayau, 1 ♀ Mt. Kinabalu.

1 ♀ Kiau-Tenompok Pass.

Phloeoba antennata B. v. W.

7 ♂ s Kabayau, 3 ♂ s Kiau, 4 ♂ s Kenokok, 1 ♂ Koung-Kabayau.

OEDIPODINAE.

Trilophidia annulata Thunbg.

2 ♂ s, 2 ♀ s Kiau, 2 ♀ s Kabayau.

Locusta migratoria L. ph. **migratorioides** R. & F.

1 ♀ Kiau.

PYRGOMORPHINAE.

Atractomorpha psittacina de Haan.

3 ♂ s Kiau, 1 ♀ Kiau-Tenompok Pass. 3 ♀ s Kiau.

Systella dusmeti Bol.

1 ♂ Kiau, 2 ♂ s Lumu Lumu, 1 ♀ Kenokok.

Systella borneensis Will.

1 ♀ Kiau.

Trigonopteryx hopei Westw.

4 ♂ s Kiau, 2 ♂ s Kenokok.

CATANTOPINAE.

Oxya sinensis Thunbg.

3 ♂ s Kiau, 1 ♂ Kabayau, 1 ♂ Kenokok, 2 ♀ s Kenokok, 1 ♀ Kabayau.

Gesonia mundata Walk.

5 ♂ s Kiau, 2 ♂ s Kiau-Tenompok Pass, 5 ♀ s Kiau.

Valanga nigricornis Burm. subsp. **saravakensis** Uv.

1 ♂ Kabayau, 1 ♂ Kiau, 2 ♀ s Kiau.

Patanga luteicornis Serv.

1 ♂ and 1 ♀ Kabayau.

Traulidea grandis sp. n. (Fig. 1 a & b.).

Antennae ♂ longer, ♀ slightly shorter than head and body together. Eyes prominent, ovate. Inter-ocular distance equal to greatest fastigial width; fastigium of vertex sloping downwards, forming a rounded angle with frontal ridge; margins of frontal ridge parallel between antennae, thence obsolescent to clypeus; in profile concave ♂, almost straight ♀. Surface of head and pronotum rugulose-punctate; lateral facial carinae almost straight in upper half, thence obsolescent.

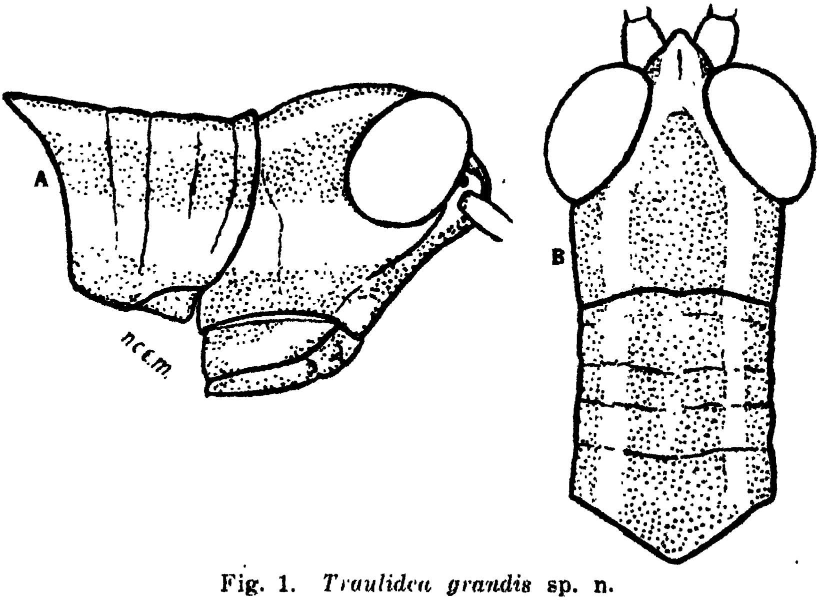

Fig. 1. *Traulidea grandis* sp. n.
A. Head and pronotum from side, ♂.
B. Head and pronotum from above, ♂.

Pronotum selliform; anterior and posterior margins of disc rounded. Prosternal spine conical, acute apically.

Supra anal plate ♂ triangular with the lateral margins sinuate, surface with three longitudinal depressions; subgenital plate ♂ broadly conical, with a transverse sulcus;

supra anal plate ♀ triangular, with a median basal sulcus and a transverse carina; subgenital plate ♀ quadrate with a mucronate projection on apical margin.

Elytra extending just beyond middle of abdomen: wings almost as long as elytra.

Antennae black, ochreous apically; basal segment brownish ochreous. Eyes brown. Head black with a broad ochreous stripe running from base of antennae below eyes to centre of posterior margin of genae, and with a broad ochreous stripe from apex of vertex to middle of inner margin of eye, thence divergent to base of head; face and clypeus with some ochreous spots.

Pronotum black with an ochreous stripe along lateral margins and along lateral lobes near lower margin; pleura black with a horizontal ochreous stripe.

Elytra blackish olivaceous with a median longitudinal ochreous stripe. Wings infumate.

Abdomen brownish ochreous. Anterior and median legs and posterior tarsi brownish olivaceous: posterior femora castaneous with sub-genicular greenish suffusion; knees brownish; posterior tibiae green: spines with black tips.

	♂	♀
Total length	21.0mm	27.0mm
Pronotum	4.5mm	5.0mm
Posterior femora	15.0mm	16.0mm
Elytra	9.0mm	10.0mm

Described from 1 ♂ and 1 ♀ Kenokok and 1 ♀ Lobang. 3,300–4,000 ft. Type ♂.

Eucoptacra pendleburyi sp. n. (Fig. 2).

Antennae longer than head and pronotum together. Fastigium of vertex sloping downwards, forming a rounded angle with frontal ridge, frontal ridge in profile straight: from the front, margins parallel to median ocellus, constricted below ocellus, thence sinuate and obsolescent to clypeus. Distance between eyes slightly less than width of frontal ridge between antennae; fastigium of vertex from above, hexagonal, lateral margins raised; surface somewhat strongly impressed. Surface of head and pronotum and pleura rugose punctate.

Supra anal plate ♂ triangular, constricted feebly laterally sub-apically and with a median longitudinal basal sulcus; sub-genital plate ♂ broadly conical; supra anal plate ♀ triangular, with a deep median longitudinal sulcus; sub-genital plate ♀ quadrate with a median projection on apical margin.

Elytra reaching just beyond apex of posterior fem apical margin rounded truncate.

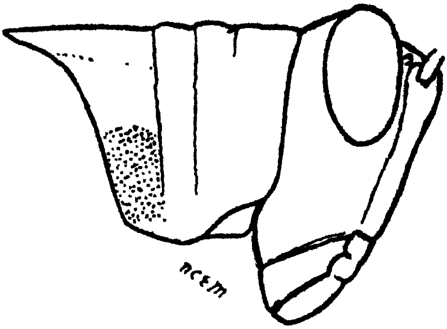

Fig. 2. *Eucoptacra pendleburyi* sp. n.
Head and pronotum from side, ♂.

General coloration brown. Antennae blackish with six apical segments reddish ochreous. Pronotum with a quadrate ochreous spot on meta zona of lateral lobes, near posterior basal angle.

Posterior femora with the outer face brownish ochreous, with two black transverse fasciae, an ochreous pre-genicular ring, the lower and inner faces red, knees black and the upper faces reddish or brownish ochreous; anterior and median legs and posterior tibiae and tarsi blackish olivaceous.

	♂	♀
Total length	21.0mm	30.0mm
Pronotum	5.0mm	8.0mm
Posterior femora	12.0mm	16.0mm
Elytra	17.5mm	23.0mm

Described from 1 ♂ Kiau-Tenompok Pass, and 1 ♀ Kenokok. 3,000–4,700 ft. Type ♂.

Eucoptacra monticola sp. n. (Fig. 3 a & b).

Antennae ♂ nearly twice as long, ♀ slightly longer than head and pronotum together. Eyes, elongate ovate, subprominent; inter-ocular distance slightly less than width of frontal ridge between antennae; frontal ridge in profile straight; from the front margins convergent at vertex, then feebly irregularly sinuate, sub-parallel; sulcate and rugose throughout. Lateral facial carinae ♂ straight, ♀

almost straight; surface of face and genae rugulose-punctate. Fastigium of vertex sloping forwards feebly, forming a rounded angle with frontal ridge; from above, fastigium of vertex rounded truncate apically; lateral margins almost straight; surface impressed.

Anterior margin of pronotal disc broadly obtuse angulate, with a feeble median incision; posterior margin acute angulate, sides feebly concave; median carina distinct, somewhat irregular, intersected by transverse sulci in pro and metazona.

Prosternal spine conical, apex acute. Supra anal plate ♂ triangular, sides sinuate, surface impressed; sub-genital plate ♂ conical, apex narrowly rounded; supra anal plate ♀ triangular, deflected laterally, and with a deep median basal depression; sub-genital plate ♀ quadrate with the apical margin obtuse angulate.

Cerci ♂ simple, curving inwards; cerci ♀ simple. Elytra reaching beyond apex of posterior femora, rotundate-truncate apically.

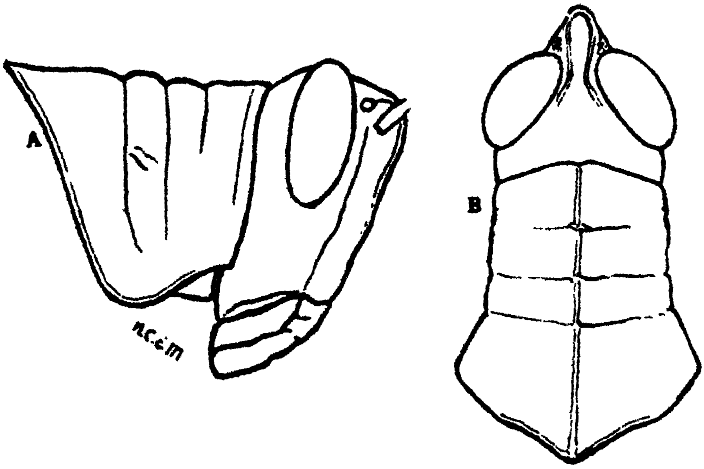

Fig. 3. *Eucoptacra monticola* sp. n.

A. Head and pronotum from side, ♂.

B. Head and pronotum from above, ♂.

Brown. Antennae brownish-ochreous in basal half. Posterior margin of disc and lateral lobes of pronotum light brown. Anterior and median femora and tibiae with some black spots, posterior femora light brown with two transverse black fasciae extending to middle of external face; outer half of lower external face black, inner half and internal face red; posterior tibiae red with some black spots basally; spines with black tips; posterior tarsi red.

Elytra with blackish maculation. Wings pale greenish basally remainder faintly infumate.

	♂	♀
Total length	21.0mm	28.0mm
Pronotum	5.0mm	7.0mm
Posterior femora	13.0mm	16.5mm
Elytra	20.0mm	25.0mm

Described from 2 ♂, and 2 ♀, Kiau, 1 ♀ Kabayau, 600 3,000 ft. Type ♂.

Traulia ferruginata Brunn.

1 ♀ Kiau, 1 ♀ Koung-Kabayau.

This species agrees with Brunner's description given by I. Bolivar (Estudio Monografico de la Section "Trauliae") with the exception that the elytra are shorter.

Catantops splendens Thunbg.

1 ♂ Kiau.

XVI. A NOTE ON CICINDELA QUADRILINEATA, F.

By N. C. E. MILLER.

A previous note on this Tiger beetle has appeared in an earlier number of this *Journal* (vol. xiii, 1927, p. 236), and the following observations, made in a different month, may be regarded as supplementary.

While at Morib, on the coast of Selangor, F.M.S., on the 20th May 1932, I saw a large number of *Cicindela quadrilineata* F., congregated close together at high tide, on posts on the seashore. The time at which this observation was made was about 5 p.m.

With one sweep of the net I captured just over two hundred and sixty specimens from an isolated post, and on the next evening there was a similar assembly on the same post.

At high tide the water level reached about half-way up this post which was then some forty yards out at sea. The distance between the lowest beetle on the post and the water level varied, of course with the swell of the incoming tide. The greatest distance was, roughly, one foot, and the shortest distance about four or five inches.

If disturbed the beetles would fly off and after circling round once or twice, most of them would return to the post: occasionally, some would alight on the surface of the water for a second or two before returning to the post. A few, however, flew off to posts some hundred yards away.

During low tide this beetle may be seen occasionally with another species, *C. sumatrensis* Herbst., running on the white sand among the debris of dead wood, coconut husks, and various kinds of dead vegetation left by the tide.

XVII. A NOTE ON CERTAIN SCOLIID WASPS PARASITIC UPON PSILOPHOLIS GRANDIS, CAST.

By H. M. PENDLEBURY.

Mr. G. H. Corbett, Entomologist, Department of Agriculture, who has been conducting an enquiry as to the damage to the roots of rubber trees by the grubs of *Psilopholis grandis* Cast., submitted to me for identification specimens of Scoliids which had been proved to be parasitic on the grubs of this Melolonthine beetle. In addition he supplied me with some interesting observations concerning their behaviour.

All such observations are worth recording as very little is known at present about the bionomics of Malayan Scoliidae, and in this case it is even more important as a definite relationship has been established between sexes that have been described in the past as separate species, and kept apart ever since through lack of evidence.

The wasps concerned are *Campsomeris javana* Lep. 1845, and *Campsomeris pulchrivestita* Cam. 1902. The former was the dominant species, and many specimens have been bred through from the egg to the adult stage in the laboratory. It has been found that the male of *C. javana* Lep. is definitely *Campsomeris iris* Lep. 1845, described from the male sex and not associated with the female owing doubtless to the strong sexual dimorphism between them.*

Dr. J. G. Betrem in his "Monographie der indo-Australischen Scoliiden" (Treubia, IX, supplement, 1928) suggests the possibility of the relationship as he says (page 108): "Das ♂ der *C. javana* Lep. ist merkwürdigerweise noch nicht mit Sicherkeit bekannt, wahrscheinlich ist es *C. iris* Lep. Die ♂♂ sind oft mit Gelb gezeichnet und hell behaart."

Under laboratory conditions, the female *C. javana* attacks and stings with vigour the beetle grub which rapidly becomes quiescent and paralysed. She then turns her prey on its back and appears to use her sting as a brush, and smears the ventral surface of the grub with it preparatory to oviposition. The egg is dropped on to one of the ventral somites, generally the fourth, though any one from the first to the fifth may be chosen, the position depending on which way the wasp was facing during the act of oviposition. The egg always assumes an erect posture.

**Campsomeris javana* Lepeletier de St. Fargeau, A. Histoire Naturelle des insectes Hymenoptères, iii, 1845, p. 498. (♀).

Campsomeris iris Lep., *ibid.* p. 547. (♂).

The egg stage lasts from two to three days, when the wasp grub hatches and commences to feed upon the beetle grub; the wasp grub continues to feed from five to six days before pupating; the pupal stage lasts from twenty seven to twenty nine days in the male, and from thirty or thirty two days in the female.

These times are fairly consistent with those already recorded in other species of Oriental Scoliidae parasitic upon other Melolonthine, Ruteline, and Dynastine beetle (Betrem *l.c.* pp. 48, 49).

As regards *Campsomeris pulchrivestita* Cam., the laboratory conditions have not appeared to favour its development. owing possibly to some special condition of humidity or other circumstance that has not been reproduced in its artificial surroundings. The mode of attack is similar to that of *C. javana*, and though the fourth somite of the beetle grub is the one usually chosen by the wasp for oviposition, any segment from the first to the seventh may be selected. The egg stage has been found to last three days, and the grub stage seven to eight days; the pupal stage in one case was forty two days.

A Bombyliid fly. *Hyperalonia tantalus* F., acted as a hyperparasite and attacked several of the wasp grubs or pupae, but they did not occur in such quantities as to be a noticeable check. A prominent feature in these flies is the six heavily chitinized cephalic spines in the pupa by means of which they are able to escape from the moderately thick, silk cocoon of the wasp, and also through the overlying soil. Other species of this family have been recorded as parasitic on mud-wasp grubs (e.g. *Sceliphron*) and even mason bees.

XVIII. PAPERS ON MALAYAN AQUATIC BIOLOGY.*

xiii. LIFE IN THERMAL SPRINGS.

By C. DOVER.

The life of thermal springs has intrigued biologists since Saussure's classic researches at Aix, where he found both animals and plants living in certain springs with a temperature of 35–46 C. Numerous papers have since been published on the subject, and on the phenomenon of thermophily in general, which have been listed and ably summarised by Brues in two recent contributions (3, 4). They also contain his own extensive observations on hot springs at Yellowstone Park, and on a series of other springs in the Western United States. It is obvious from Brues's bibliographies that thermophilous organisms have been studied throughout the world, except in Malaya, where hot springs of high temperature are both numerous and accessible. The present note has, therefore, been written to stimulate work on a subject of great interest.

With obvious exceptions, practically every group of animals known to occur in fresh water is represented in the fauna of thermal springs (summarised by Brues, 5), some species being able to exist in both habitats, while a few are restricted to the latter. Of the unicellular animals, Issel took an *Amoeba* at 50–52 C, Ciliates at 40° C, and certain other Protozoa at 54.5 C, in thermal springs in Italy. He also found Rotifers to be fairly abundant in these springs, and discovered the only worm known from such a habitat, which was found in water at 40 C. Of the other groups the Insecta, particularly Coleoptera and Dipterous larvae, appear to be the most abundant, but Arachnida, Crustacea, Mollusca, and even Amphibia and Fishes have been found. In India, Hooker took a certain water-beetle at 44–45 C in the hot springs at Soorujkund, Bihar, and in the same locality collected several frogs at 32 C.

Among the most interesting thermophilous organisms are the mites of the family *Thermacaridae*, which was originally created for a species found in a hot spring near Lake Baikal in Siberia. The researches of Brues have since resulted in the discovery of another species (*Thermacarus nevadensis* Marshall) in springs at Nevada with a temperature from 34°–45° C and a p^{H} of 7.4 to 9.6–a very varied range indicating the adaptability of this species.

It would appear from the recorded observations that the temperature tolerance of animals does not generally exceed 45 C, higher temperatures acting directly upon the protoplasm, or at least on the cell metabolism. The thermal resistance of the lower plants is however, much higher, Hooker having taken *Leptothrix*, one of the blue-green algae popularly known as iron bacteria, in the waters of certain Tibetan springs at a temperature of 75.5° C, while Sibractly found living algae of this group in the same region at 78.8° C. *Oscillatoria* is known from waters of very high temperature in Europe, while filamentous algae have even been found in the geysers of Iceland.

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*Continued from Vols. xvi, 1931, pp. 505–506, and xiv, 1929.

The limits of thermal resistance in the algae formed the subject of an elaborate memoir by Setchell in 1903. According to him chlorophyll-bearing algae occur regularly in calcareous springs at a temperature of 60–63° C, the forms without chlorophyll being able to stand a temperature of 71° C. In the alkaline waters of silicious springs, Setchell found that higher temperatures could be tolerated by the algae, chlorophyll-bearing forms occurring up to 77° C and non-chlorophyll forms up to 89° C. This last temperature, at the altitude at which the springs he investigated were found, was practically the boiling point. Equally remarkable in this respect are certain bacteria, some of which are unable to survive a temperature below 50° C, and can resist a temperature of 83–85° C and possibly more. *Bacillus thermophilous* Miquel, for example, grows between 42°–70° C, the most favourable temperature for its development being between 65–70° C.

These bacteria and algae are probably the only groups of organisms which have persisted in thermal waters since the earliest geological times, when, according to our conceptions of the earth's history, all organisms must have belonged to a thermal biota. The present fauna of thermal springs has, however, undoubtedly migrated from freshwater, the fauna of which is naturally more adaptable than the marine fauna. In this connexion it is interesting to note that the individuals of those species which occur both in freshwater and in thermal waters have a different thermal death-point, Plateau having shown that the maximum temperature which individuals taken from freshwaters could survive is considerably less than the thermal death-point of individuals of the same species taken from hot springs. We have here some evidence for the belief that the fauna of hot springs is the result of the inheritance of physiological adaptations to a peculiar environment.

What is the nature of this tolerance to temperatures which normally coagulate protoplasm? Many explanations have been postulated, the most iconoclastic being that of Mereschkowsky, who believed in the existence of two types of protoplasm. He assumed that the higher cells represent symbiotic associations or amoeboplasma, while the cells of the bacteria and most fungi are of a single primordial type or mycoplasma, one of the main differences between the two types being the latter's resistance to heat. This theory recently received some support from Wallin, who believed the mitochondria to be micro-organisms living symbiotically in the cells of both plants and animals. These mitochondria are very susceptible to heat, and do not occur in the blue-green algae and the bacteria, the primitive thermal groups. Wallin concluded, therefore, that the presence or absence of mitochondria results in susceptibility or resistance to heat.

Searching for data with which to compare the fauna of thermal springs we find a natural parallel in the inhabitants of deserts, in some of which the surface temperature reaches as much as 84° C. Buxton found an orthopterous insect actively moving about in the desert at a temperature of 50.8° C, and, by the use of an ingenious instrument known as the thermocouple, demonstrated that its body temperature closely approximated to that of the soil. This proves experimentally the natural inference that only those animals which can survive the physiological disturbances of an increased body-temperature can survive a thermophilous existence, provided the temperature does not have a more drastic influence on its protoplasm or metabolism.

So much for general considerations. We may turn now to our knowledge of Malayan hot springs. Biologically, as I have already said, it is very scanty, but the chemistry of hot springs in Selangor and Malacca was investigated by Bott (2) in 1891. He found that these springs were of the silicious type, and arise from beds of granitic rock coated with silicious sinter on the surface. Like all such silicious springs, in which the silica is dissolved in the presence of sodium carbonate, the water is alkaline in reaction and contains considerable quantities of hydrogen sulphide, while the water of calcareous springs, which contain calcium carbonate, are acid in reaction owing to the presence of carbon dioxide.

Bott analysed the waters of six springs in Selangor and three in Malacca, and gave for them the following temperatures: Setapak Spring, Kuala Lumpur, 50° C (=122° F. I found the p^H to be 8.0); Gombak Spring, 54° C =129° F,); Semuniah Spring, 50° C; Dusun Tua Spring, 50° C (I found the temperature, however, to be 70° C (=158° F.) and the p^H 8.8); Ulu Selangor Spring, 38° C (=100.4° F,); Ulu Klang Spring, 84° C (=183.2° F, p^H 7.8); Ayer Panas, Malacca, 55° C (=131° F,); Spring near Alor Gajah, 55° C (in bricked well): Cheran Puteh Spring, 53° C (=127.4 F,). Of these the most interesting is perhaps the Cheran Puteh Spring, which has a bed of soft mud and arises alongside a brook of cold water, suggesting investigations on the adaptability of the organisms occurring in the latter; and the Ulu Klang Spring on account of its high temperature and the recorded presence of algae.

Algae have also been reported by Bott from the Setapak and Ayer Panas springs, but though the material was sent to the British Museum it does not appear to have been determined. I have, however, taken two species of blue-green algae living together in the Setapak spring, which have been determined by Biswas (1) as *Calothrix javanica* de Wild, and *Phormidium tenue* Gomont. These species were found among the dense gelatinous masses of green and orange-red colour which are common in all the springs in Selangor and Malacca. These masses are not algae, as the amateur may at first believe, but are the result of the decomposition of organic matter. Yet they deserve careful investigation even though one is naturally sceptical regarding the suggestion contained in the following sentence by Bott: "How far this growth may be looked upon as a whole, as an individual, as a living thing increasing actively, or a dead product growing passively by mechanical addition—these are questions of considerable interest, to be settled by a separate investigation, and I hope to discuss the subject fully in a further paper." This paper, however, does not appear to have been published.

The springs in Selangor which I have seen appear to contain no macroscopic fauna, though several organisms are found in their overflow. At Dusun Tua I found a Hydrophilid beetle, identified by Dr. d'Orchymont (6) as *Coelostoma horni-transcaspicum* Reitter, in the overflow (40°–45° C) from the main bricked up area. In the same situation I found two water-bugs: the common Malayan Gerrid, *Gerris fossarum* Fabr. (7), which is very adaptable and is allied to the American *G. remigis* known to occur in thermal waters, and a new species of the genus *Helotrephes*, the description of which has not yet been published. Further study may show, however, that the cooler waters of these springs contain a fairly abundant biota, and microscopic, perhaps even macroscopic, organisms may also be found in the springs at their sources.

In conclusion, a word may be added regarding the methods of investigation. Physico-chemical investigations are important as thermal springs are also characterized by "the presence of certain salts in solution in considerable amounts and greatly varying proportions," by a deficiency of oxygen in solution and frequently by an excess of carbon dioxide or hydrogen sulphide. The temperature should be taken with a standardised thermometer; the Hydrogen-ion concentration is determined easily by the colorimetric method, with the indicators and standards supplied by the

British Drug Houses Ltd. Though an enthusiast may determine the oxygen content himself by the Winkler method, it is perhaps best left to professional chemists, for whom two Winchester quart bottles of water should be collected from some distance below the surface. These samples will permit a complete chemical examination, and at the same time a small quantity can be collected in a sterilised bottle for bacteriological examination also.

The biological investigations will need only an ordinary water-net, a plankton-net, and a bottom-dredge with a bag of very fine mesh. All the organisms collected, together with bottoms samples, and samples of the gelatinous masses, can be preserved in 70% spirit, though for algae it is preferable to use formol-alcohol.

Arrangements for the identification of material can be made through the Selangor Museum, Kuala Lumpur, F.M.S.

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XIX. FAUNA OF THE BATU CAVES, SELANGOR.*

xviii. APTERYGOTA.

Py GEORGE H. CARPENTER, *D. Sc.*

Keeper of the Manchester Museum, University of Manchester.

(With eleven text figures).

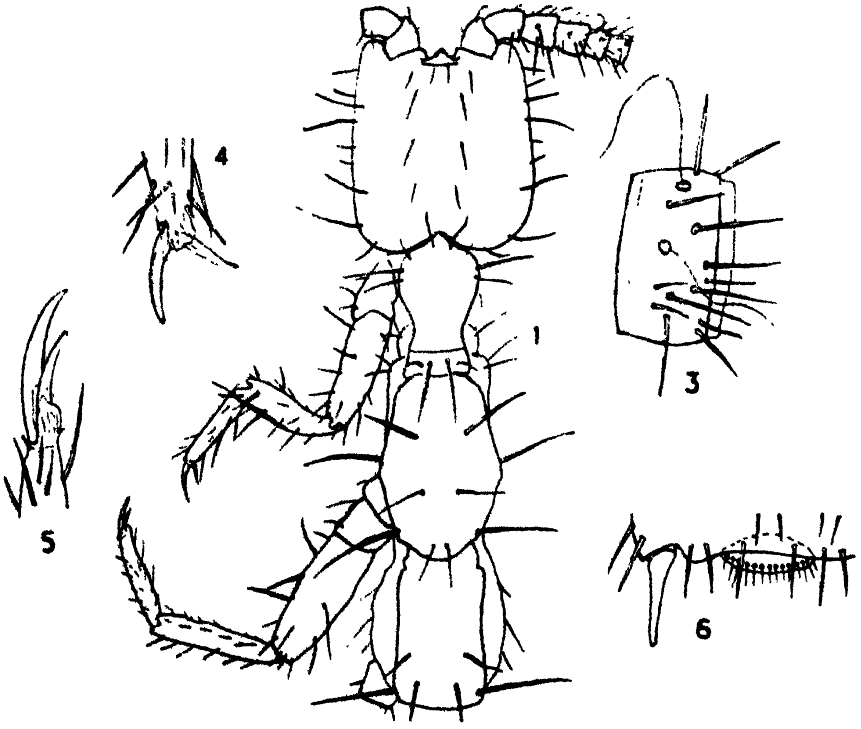
The small collection of Apterygota from the Batu Cave, Selangor (Federated Malay States) recorded in this paper was entrusted to me six years ago by the Director of the Museum at Kuala Lumpur, and I regret that the pressure of other work has prevented me from examining and determining sooner these interesting insects. Three species are represented in the collection—one a member of the Thysanura, and the other two Collembola (Springtails) one of these as well as the Thysanure (a *Iapyx*) being apparently hitherto undescribed.

Order THYSANURA.

Family IAPYGIDAE.

Genus Iapyx Haliday.

Iapyx inferus sp. n. (Figs. 1–6).



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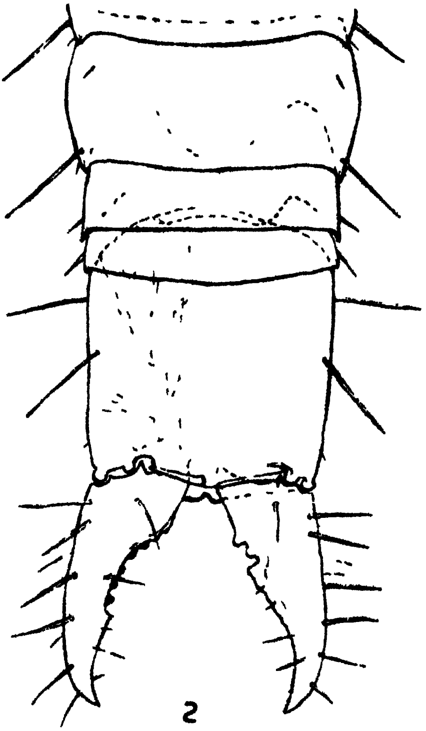
*Continued from Vol. xiv, 1929, pp. 325–387.



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Feelers with 32 segments. Thoracic terga elongate (fig. 1). Legs with foot three-quarters as long as shin; foot-claws elongate and slender (figs. 4, 5,). Seventh abdominal tergum (also sixth and eighth) with hind corners shortly acuminate (fig. 2). First abdominal sternum with narrow vesicles, each with fourteen glandular spines (fig. 6). Forceps (fig. 2) nearly as long as tenth abdominal segment, markedly asymmetrical, with the prominent tooth on the right appendage near the base and that on the left appendage sub-apical, inner margin of appendages crenulated.

Length 7 mm. Colour of adult uniform chestnut-brown; immature specimen with the head, thorax and nine abdominal segments pale.

Locality Selangor: Batu Cave; one female in Dark Cave on stream, coll. C. Dover, 8th Nov. 1926; one immature specimen, coll. H. M. Pendlebury, September 1921.

This species appears referable to the genus *Iapyx* in its modern restricted signification. The arrangement of the sensory hairs on the proximal antennal segments (fig. 2) is normal, but the acuminute hind quarters of the seventh abdominal tergum are usually short. In this character, as well as in the marked asymmetry of the forceps, *I. inferus* resembles some of the Australian species (such as *I. Leae* and *I. Froggatti*) lately described and figured by Silvestri (1930). The elongate, relatively narrow thoracic terga (fig. 1) are a characteristic feature of *I. inferus.*

Order COLLEMBOLA.

Family ENTOMOBRYIDAE.

Entomobryini.

Genus **Sinella** Brook

Sinella caeca (Schött).

Locality Selangor: Batu Cave; one specimen in Dark Cave on stream, coll. C. Dover, 8th Nov. 1926; one 800 ft. from entrance 1st August, 1926.

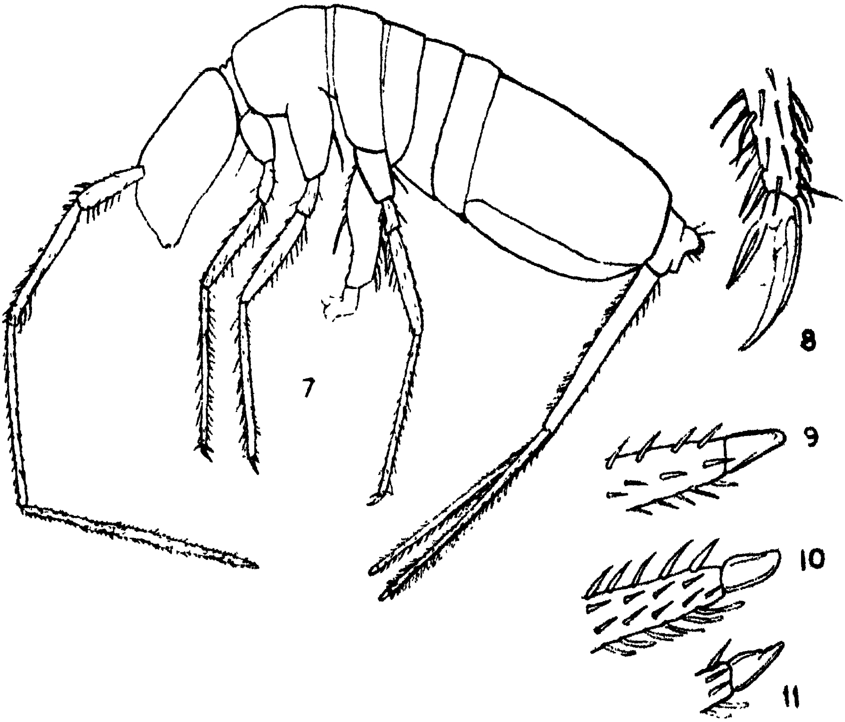
This is one of the wide-ranging, eyeless species of Collembola that inhabit obscure and underground localities. Originally described from California by Schött (1896), it has a wide range in Europe including certain Moravian Caves, while Handschin (1926) has described a variety (*edenticulata*) from ants' nests in Java. In north European countries it has been found in greenhouses and other buildings.

Paronellini.

Genus **Pseudoparonella** Handschin.

The Paronellini form a tribe of Collembola distinguished by the long, rigid dentes of the spring, contrasting with the flexible dentes of most Entomobryidae. A fair number of genera are known from tropical regions. *Pseudoparonella* was established by Handschin (1925) for the scaled springtails of the group which have the mucro of the spring markedly reduced and bearing, at most, two (usually feeble) spines, while in the typical *Paronella* the mucro is prominent with three or four strong teeth. *Pseudoparonella* seems to be especially characteristic of the Indo-Malayan zoological area.

Pseudoparonella doveri sp. n. (Figs. 7–11).



Eyes wanting. Feelers nearly as long as head and body, fourth segment imperfectly ringed. Spring two-thirds length of head and body, the mucrones blunt with teeth usually wanting. Feet without clubbed tenent hairs; claw slender, curved, with minute sub-basal prominence, empodial appendage slender, lanceolate, untoothed (figs. 7–11). Colour pale yellow. Length 2 mm.

Locality. Selangor: Batu Cave; several, July 1926; in side passage, Dark Cave, swimming in large numbers on stream, coll. C. Dover, 10th Sept. 1926.

This is a typical cave species presenting some structural features of considerable interest. The feelers, legs and spring are elongate and slender. The relative lengths of the antennal segments are approximately as 3: 5: 6: 10; the third and fourth segments are very slender, the latter imperfectly annulated, and bearing whorls of delicate hairs. The tibio-tarsus of each leg is half as long again as the thigh; on the tibio-tarsus are numerous strong spinose hairs (fig. 8). Each foot bears a slender tapering bristle instead of a clubbed tenent hair. The spring is straight and long, the rigid dentes longer than the manubrium (as 9: 7);

the mucro is short and rounded at the tip, showing in most cases no trace of teeth (figs. 9, 10), but in a few specimens (fig. 11) the tip is less blunt and has two minute teeth on the upper edge.

This is the characteristic "resident" springtail of the Batu Cave, as shown by its relative abundance and its occurrence in several of the passages.

Description of Figures.

Iapyx inferus.

Fig 1. Head and thorax, dorsal view, showing left front and intermediate legs and basal part of right feeler. x 54.
2. Abdomen, dorsal view, from hinder edge of sixth tergum, showing forceps with adductor muscles of left side x 54.
3. Fifth segment of right feeler dorsal view. x 320.
4. Left front foot with claws and sheathing empodium, lateral view x 180.
5. Left intermediate foot, ventral view. x 180.
6. Hinder edge of first abdominal sternum showing stylet and vesicle x 140.

Pseudoparonella doreri.

Fig. 7. Insect, lateral view (scaling not shown) x 54.
8. Hind foot, lateral view x 360.
9. Tip of dens with mucro, dorsal view x 360.
10. „ „ „ „ lateral view. x 360.
11. „ „ „ „ lateral view, of variety with minute teeth x 360.

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XX. DIPTERA NEMATOCERA FROM MOUNT KINABALU.

By F. W. EDWARDS.

(*British Museum, Natural History*).

(With one plate and thirteen text figures).

The following report is based entirely on collections made by Mr. H. M. Pendlebury during an ascent of Mt. Kinabalu (North Borneo) in the early months of 1929, these being the first collections of Nematocera ever made on the mountains of North Borneo. The localities of the various camps,[1] with altitudes and dates, are as follows:

Locality	Altitude	Dates
Kabayau	600 ft.	March 24.
Kiau	3,000 ft.	April 21—30.
Kenokok	3,300 ft.	April 22—26.
Tenompok Pass	4,700 ft.	March 18.
Marei Parei	5,000 ft.	April 27—May 1.
Lumu Lumu	5,500 ft.	March 20—April 11.
Kamborangah	7,200 ft.	March 19—April 5.
Pakka	10,200 ft.	March 23—26.

It should be noted that Kabayau and Kiau are in the zone of secondary forest and cultivation, all the other localities being in the primitive forest which covers the mountain above an altitude of 3,000 ft. Consequently it is not surprising to find that the fauna of Kiau is rather different from that of the other localities and includes a greater proportion of known species.

Up to the present about 200 species of Nematocera (excluding 100 Culicidæ) have been recorded from the whole of Borneo, the great majority of these being described in two papers by the writer.[2] This collection from Mt. Kinabalu includes about 180 species, only 43 of which had previously been recorded from Borneo, most of these being from the mountains of Sarawak. Of the remainder, 98 are described as new in this report, the others being identified with species previously known from Malaya, Java, Sumatra or (in a very few instances) the Philippine Is., or Japan.

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[1] For descriptive account of the expedition, by Messrs. H. M. Pendlebury and F. N. Chasen, *vide* Journ. F.M.S. Mus. xvii, pp. 1—38 (1932).

[2] Diptera Nematocera from the Mountains of Borneo. Sarawak Mus. Journ., Vol. III, No. 10, pp. 243—278 (1926).

Diptera Nematocera from the lowlands of North Borneo. Journ. F.M.S. Mus., Vol. XVI, pp. 486—504 (1931).

It had been anticipated that the Mt. Kinabalu fauna might show a greater degree of affinity with the faunas of the Philippine Islands or Formosa than is evident in Malaya or even in Sarawak. As regards the Nematocera there is some evidence that this is the case, but the material available from any of these regions is not yet full enough for a detailed comparison. So far as can be judged, the Tipulid fauna is much more like that of Formosa than that of Luzon, but the species, though in many cases very similar, are seldom actually the same. The Nematocera of Palawan, which might be expected to show the greatest resemblance to those of North Borneo, have not yet been investigated.

About one-third of the species represented in the collection belong to families other than Tipulidæ; of these, the new mimetic *Platyura*, the new genus of Allactoneurinæ the new *Blepharocera* and the new *Nemopalpus* call for special note, as does the occurrence of two species of *Anisopus* which seem to be representatives of the European *A. fenestralis* and *A. punctatus*. In the Mycetophilidæ, the large preponderance and variety of species in the Sciarinæ is noteworthy, this being also the case in Malaya. The five species of Simuliidæ are the first of this family to be recorded from Borneo.

Among the Tipulidæ the genus which is best represented is *Limonia* (sens. lat.), with 32 species, of which, however, only 11 are new. On the other hand almost all the rather numerous species of *Helius* are new, and a very high proportion of new species (12 out of 21) is found among the Tipulinæ, a fact which confirms the conclusion previously arrived at that the larger species of this family show a greater tendency to the development of local races and species than the smaller ones. The Eriopterini and Hexatomini are not very strongly represented, and the majority of the species of these groups were already known. Very striking is the almost complete absence of the genus *Eriocera;* and it is noteworthy that some groups which are extensively developed in the Philippines (e.g. *Polyphragma, Scamboneura, Pselliophora*) also appear to be absent. Rather unexpected is the occurrence of *Discobola argus* (together with two other species of the same subgenus), which seems to indicate the presence of a definite holarctic element in the fauna.

Through the kindness of Messrs. C. Boden Kloss and H. M. Pendlebury the types of all new species are preserved in the British Museum.

Family MYCETOPHILIDÆ.

Subfamily CEROPLATINAE (incl. MACROCERINAE).

Macrocera picturata sp. n. (Pl. XII, fig. 1.)

♂. *Head* light brownish, with a small black ocellar triangle; palpi and first few segments of antennæ light brownish. Antennæ about twice as long as body, rather stout towards base. *Thorax* dark brown, scutum mainly occupied by three shining blackish stripes, the middle one divided anteriorly by a pale line; pleuræ mainly blackish. *Abdomen* largely blackish above, light brown beneath; tergites 1—2 with broad light brown basal bands; similar but narrower bands on 3 and 4. *Legs* brownish, middle and hind coxæ dark brown at tips. *Wings* (pl. xii, fig. 1) bare, with faintly yellowish ground-colour; cells *C*, *Sc* and base of cell *Cu2* deep yellow; conspicuous dark brown markings as figured. Anal angle nearly square. Halteres with outer half of knob dark.

Length of body, 7 mm.; antennæ, 15 mm.; wing, 7 mm.

Kamborangah, 1 ♂.

A very beautiful species related to *M. ornata* Brun. (India) and *M. decorosa* Skuse (Australia), from both of which it differs in the presence of a dark band along the posterior margin of the apical third of the wing.

Macrocera ephemeræformis Alex. (Pl. XII, fig. 2).

♀. Allied to *M. alternata* Brun. (Himalayan region), differing chiefly as follows:—Antennæ longer, less conspicuously ringed, mostly brown on outer half, pale rings on basal half broader but duller brown; first flagellar segment only slightly darkened at base, next few with less than the basal half blackish, rest brown, indistinctly lighter towards tips. *Wings* (pl. xii, fig. 2), as in *M. alternata*, with conspicuous alternating dark brown and yellow spots costally, but spots over humeral cross-vein and tip of *Sc* much larger; no obvious darkening at tips of *M1*, *M2* and *Cu1*, but a rather broad brown seam extending almost the whole length of *Cu2*.

Length of body, 8.5 mm.; antenna, 8 mm.; wing, 15 mm.

Kamborangah, 1 ♀.

Alexander's type was a male from Japan (Honshiu); the description corresponds so nearly (except as regards length of antennæ) with the female before me that I have no hesitation in referring it to the same species. I have also seen specimens, differing in minor details, from Malaya and Assam.

Macrocera trinubila sp. n. (Pl. XII, fig. 3.)

♀. *Head* dark brownish, lighter on occiput. Antennæ dark brown, lighter towards base. *Thorax* shining brown, pleuræ and post-notum darker; a rather ill-defined blackish brown stripe extends from middle coxa on to sides of scutum. *Abdomen* with segment 1 ochreous, 2—7 mainly black, but each with a rather narrow ochreous basal band. *Legs* brownish, middle coxæ darker than the others. *Wings* (pl. xii, fig. 3) bare, ground-colour greyish, with three dark brown areas towards costa separated by two small pale yellowish areas. Tips of veins not darkened. Costa much produced. Halteres pale.

Length of body, 4 mm.; wing, 4.5 mm.; antenna 6.5 mm.

Kamborangah, 1 ♀.

Very distinct from other species by the wing-markings.

Macrocera klossi sp. n.

♂ ♀. *Head* blackish above, yellow round antennæ. Palpi black. Antennæ with scape ochreous, flagellum dark brownish. *Thorax* with brownish ground-colour, moderately shining; scutum mainly occupied by three blackish stripes, which in ♀ are quite fused; pleuræ also mainly blackish. *Abdomen* dark brown, posterior margins of segments pale, especially in ♀. Hypopygium normal. *Legs* brownish, all coxæ completely pale. *Wings* hairy on about the apical fourth. Ground-colour clear; apical fifth light brown, but the marking clearly defined; a small brown area over tip of *R1;* a large rounded brown patch over stem of median fork, not reaching costa but crossing cell *Cu1* near base and continued faintly as a grey seam along *Cu2*. Costa much produced; *R4* short (situated well before the dark tip), its basal half vertical, outer half bent outwards, tip of *R1* considerably thickened. Halteres with dark knob, stem mostly pale.

Length of body, 4.5 mm.; wing, 5.5 mm.; antenna, ♂ 17, ♀ 13 mm.

Kamborangah, 1 ♂ 1 ♀.

Allied to *M. nitens* Edw. (Samoa), differing in colour of thorax and wing-markings.

Platyura (Isoneuromyia) polybioides sp. n. (Fig. 1).

♂ ♀. *Head* blackish above, orange on face and above antennæ. Palpi and labrum black. Antennæ alike in the two sexes (slightly longer in ♂), stout and much flattened, fully as long as head and thorax together; first four or five flagellar segments orange, scape and outer part of flagellum black. *Thorax* yellow; mesonotum slightly shining, with three confluent black stripes, median stripe reaching front margin, lateral stripes much abbreviated in front, but reaching back to the yellow scutellum; pleuræ largely dull blackish, but postnotum (mediotergite and pleurotergites) yellow, without the silvery dusting which is present in many species of this sub-genus. *Abdomen* blackish (largely owing to dense pubescence), segments 1—4 with ochreous basal bands, a less distinct light band on 5. In both sexes segments 1 and 2 are narrow (2 being rather longer than

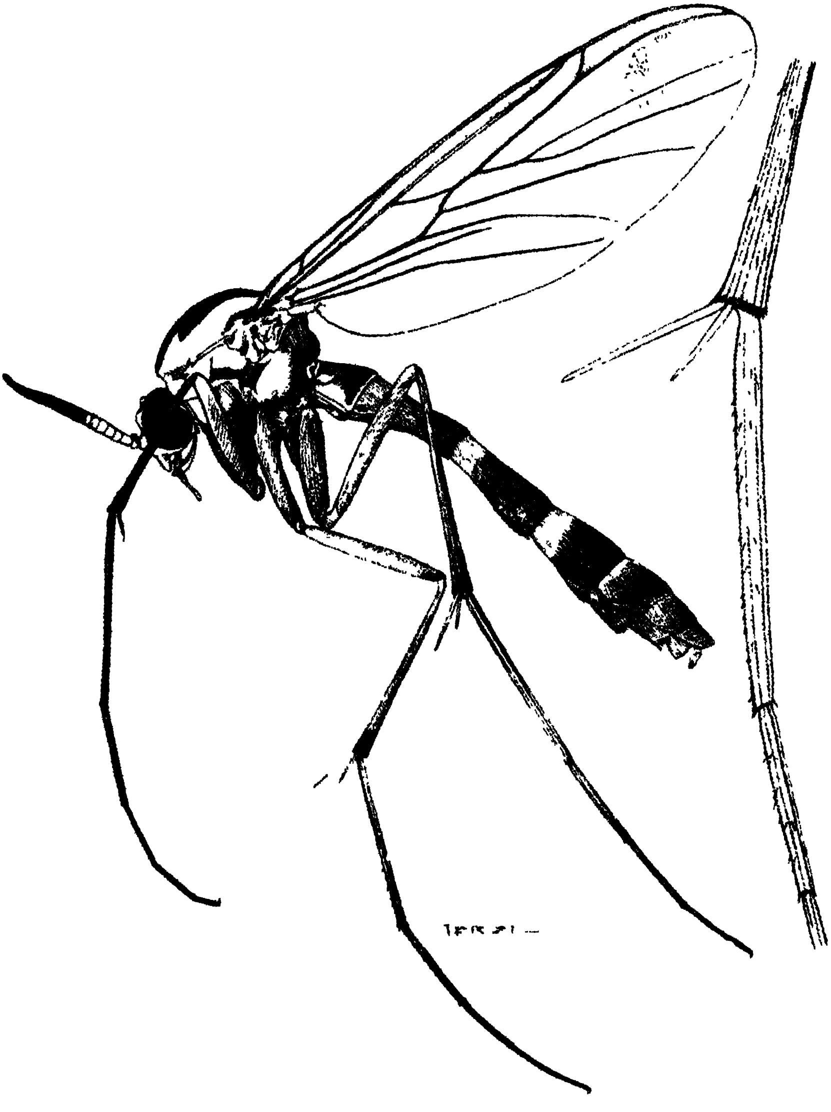

Fig. 1. *Platyura (Isoneuromyia) polybioides* sp. n.
♀ × 6. With portion of hind leg
further enlarged.

usual), 3 gradually widened, and 4 and 5 still wider, so that the abdomen has a petiolate, wasp-like appearance. Hypopygium small, styles with two black teeth as usual in this subgenus. Cerci of ♀ short and mostly hidden. *Legs* with coxæ and femora ochreous, front femora somewhat darkened above at base. Front tibia brownish at base, outer half blackened, spur black. Middle and hind tibiæ brownish, spurs pale yellow. Front tarsi black, first segment half as long again as tibia. Middle tarsi with first segment somewhat paler than tibia, rest darkened. Hind tarsi with first segment whitish, very slightly swollen in both sexes, with only a few rows of close-set setulæ, only three such rows being visible in dorsal view; second segment somewhat pale, rest dark. *Wings* rather broad, slightly brownish tinged, with a large but not well-defined darker brownish patch at tip. Venation normal for the sub-genus; *An* ending near tip of *Cu2*. Halteres orange.

Length of body, 13—14 mm.;wing, 12 mm.

Lumu Lumu, 1 ♂, 1 ♀.

This large *Isoneuromyia* is remarkably distinct from others hitherto described, notably by the strongly bicolored antennæ, shape of abdomen, pale spurs of posterior tibiæ, and form and colour of hind tarsi; nevertheless it shows all the essential features of the subgenus.

The form of the body is distinctly wasp-like, and there can be little doubt that this species is a definite mimic of a Vespid. In the present collection there is a female wasp taken by Mr. Pendlebury at the same time and place as the *Platyura*, and sent with the fly to show their similarity; the resemblance is fairly close in form and colouring of the body, though not of the antennæ and legs. This wasp is presumably the model; it has been determined for me by Mr. R. B. Benson as *Polybia rhaphigastra* Sauss.

P. polybioides is not the first wasp-mimic of this subfamily to be discovered; the Australian *Nicholsonomyia vespiformis* Tonn. is also apparently a mimetic form, and in many respects is not unlike *P. polybioides*, although in the case of *N. vespiformis* no definite model has been recorded. Tonnoir's genus *Nicholsonomyia* is very close indeed to the subgenus *Isoneuromyia* of *Platyura*, in fact the only important distinction appears to be the presence in the former of a distinct basal section of media dividing the basal cell into two.

Platyura (Rutylapa) kinabaluensis sp. n.

♂ ♀. Allied to *P. (R.) penrissenensis* Edw. (Sarawak), differing as follows:—Thorax darker. Postnotal mediotergite bare, without the usual small bristles (though in all other respects the species is typical of the subgenus *Rutylapa*). Male hypopygium with the tergite larger, square-ended; style with the blackened tip pointed and somewhat narrowed instead of expanded. Wings with the markings more conspicuous; outer brown band filling tip of cell *R4* and extending irregularly almost or quite to hind margin; brown area over tip of *Cu2* larger. Halteres with knob darkened, especially on its basal half.

Length of body, 5.5 mm.; wing, 5.5 mm.

Lumu Lumu, 1 ♂ 1 ♀ (*in cop.*)

In these two specimens there is a sexual difference in the spurs of the middle tibiæ. In the male (as in the male of *P. penrissenensis*) both spurs are very short, much shorter than the tibial diameter; in the female (as in both sexes of the subgenotype, *P. ruficornis* Zett.) the outer spur is about as long as the tibial diameter, the inner spur only about a quarter as long. Most if not all species of *Rutylapa* seem to have the mid-tibial spurs shorter than in most other subgenera.

Platyura (Rutylapa) binocellifera sp. n.

♀. *Head* blackish, face more brownish. Only two ocelli, placed rather close together. Supra-antennal grooves rather more pronounced than usual, as is the ridge above them. Antennæ with scape and base of first flagellar segment light brownish, flagellum black, last segment with tip narrowed and pointed. Palpi pale yellowish, rather long. *Thorax* light brownish, somewhat shining, postnotum and pleuræ darker brown, pleurotergites almost black. Spiracular hairs present but few in number; mediotergite and anepisternite bare. *Abdomen* brownish, segments indistinctly lighter posteriorly, first tergite black. *Legs* yellowish, tarsi darkened; spurs normal for the subgenus. Front tarsi long, basitarsus considerably longer than tibia. *Wings* faintly yellowish, with an ill-defined dark cloud at tip below *R5*, veins dark; venation normal for the subgenus; *R5* straight, *M2* and *An* somewhat abbreviated; *m-cu* fusion less than half as long as stem of median fork. Halteres with knobs black.

Length of body, 4.5 mm.; wing, 4.5 mm.

Lumu Lumu, 1 ♀.

This is probably related to *P. funerea* Brun. (Sikkim), which also has only two ocelli, but is said to have the thorax dull black, with greyish shoulders. Although the new species differs from typical *Rutylapa* in the absence of the median ocellus and the bare anepisternite and mediotergite, it exhibits all the other features of the subgenus and I do not consider it necessary to exclude it therefrom.

Subfamily SCIOPHILINAE.

Leptomorphus chaseni sp. n.

♀. Allied to *L. ornatus* Brun. (Assam) which it rather closely resembles, differing as follows:—Antennæ rather shorter, most flagellar segments only a little longer than broad. Prothorax and sternopleura shining black, like remainder of thorax (though the scutellum is yellow). Ovipositor with a group of stiff black bristles beneath, instead of yellowish hairs. Hind femora with the tip darkened on the upper surface only, no darkening at base. Wings with only a faint darkening at tip. Knob of halteres completely black, as well as most of stem.

Kenokok, 1 ♀.

L. ornatus and the new species belong to a group of closely allied Oriental and African forms which differ from the genotype (*L. walkeri* Curt.) in the reduction of the thoracic hairs and bristles, the fine hairs of the scutum being almost confined to two dorso-central rows; in both *L. ornatus* and *L. chaseni* the minute dorso-central hairs are uniserial or irregularly biserial.

Mycomyia spp.

The collection includes three female specimens, apparently representing three distinct species, all resembling the British *M. maura* Walk. In the absence of the male sex it seems undesirable to describe them; one of them may possibly be a form of *M. unipectinata* Edw. (Ceylon).

Leia (s. str.) **major** sp. n.

♂ ♀. *Head* black above, face brownish. Palpi light brownish. Antennæ with first few segments light brownish, remainder dark. *Thorax* mainly black, moderately shining, only the pronotum orange. Scutum largely bare, acrostichal and dorso-central hairs roughly biserial. Scutellum with four strong bristles. *Abdomen* black, slightly shining, with small lateral basal yellowish spots on each segment, on 4 and 5 forming narrow basal bands. Hypopygium small. *Legs* brownish, coxæ and front femora lighter; posterior femora extensively blackened beneath and narrowly black at tip. Middle tibiæ with strong bristles in four rows: four dorsal, four external, four ventral (two towards base rather externo-ventral, the two towards tip rather interno-ventral) and four internal. Hind tibiæ with strong bristles in three rows: four dorsal, five external and four interno-dorsal. *Wings* with a strong brown tinge, apical fourth much darker brown; all veins very dark; no clouds over any veins in middle. *R1*, *r-m* and stem of median fork all about equal in length; *M2* bent upwards apically; *Cu1* not detached at base, rather sinuous. Halteres orange.

Length of body, 4—5 mm.; wing, 5—6 mm.

Kamborangah, 1 ♂ 1 ♀.

Distinguished from other Oriental species with a black mesonotum by its larger size, chætotaxy of tibiæ, etc.

Leia (Indoleia) bisetosa Edw.

Kenokok, 1 ♀.

Subfamily ALLACTONEURINAE.

Allactoneura obscurata Walk.

Kiau, 1 ♀.

The specimen agrees with Walker's types from Sula and Menado. *A. obscurata* differs from *A. nigrofemorata* de Meij. in its completely black abdomen and in having the costal border of the wing dark on the outer half or more.

Genus **Eumanota** gen. n.

Head shaped much as in *Allactoneura* and *Manota*, but not quite so flat behind (somewhat conical). Strong, recurved, outstanding bristles present round greater part of orbits, but those at vertex (immediately behind ocelli) quite short. Three ocelli in a straight line, laterals very large and close to eyes. Face broad, with numerous short bristles in addition to shorter pubescence, not divided by a suture into an upper bare portion and a lower pilose portion (as in *Allactoneura*) but the vestiture uniformly distributed (as in *Manota*). Palpi apparently consisting of three segments, first expanded, rather leaf-like, second inserted near base of first, almost cylindrical, third inserted before tip of second, very long and whip-like, several times as long as first and second together. *Thorax* with rather numerous short bristles on pronotal lobes and propleuræ (thus differing from both *Allactoneura* and *Manota*). Pleurotergites hairy. No dorso-central bristles. *Abdomen* with six visible segments as usual. *Legs* with front coxæ very large, reaching to the tips of the long posterior coxæ; femora flattened; tibial setulæ in regular close-set rows throughout; bristles much shorter than tibial diameter, spurs moderately long, formula 1. 2. 2. Hind tibia with outer and inner combs at tip, formed of slender bristles. *Wings* (pl. xii, fig. 4) with the microtrichia irregularly arranged; rather numerous erect macrotrichia along whole posterior border of wing. Venation: *Sc* very short, ending in *R; R1* about as long as *r-m*, which is long and almost horizontal; *R5* much curved and running close to costa, which is much produced; median fork with very short stem; *M1* faint at base for a short distance, ending slightly above wing-tip and immediately beyond tip of costa, so that cell *R5* is unusually narrow; *Cu1* and *Cu2* arising separately at base of wing; *An* abbreviated, running unusually close to *Cu2; Ax* absent.

Genotype, *E. leucura* sp. n.

This is a remarkably distinct genus, which seems to connect the Manotinæ with the Leiini. It differs from the Manotinæ as defined by me in the possession of numerous though short prothoracic bristles, but shows so many points in common with *Manota* that there seems little doubt that the two are somewhat closely related. The venation of the new genus is absolutely distinctive, but resembles that of *Manota* (in which the venation is degenerate) in several respects, especially the position of the tip of *M1* above the wing-tip and close to the tip of the costa. The remarkable form of the palpi also reminds one of the somewhat similar form of these organs in *Manota.*

Eumanota leucura sp. n. (Pl. XII, fig. 4.)

♂. *Head* dark brownish, lighter round orbits. Face dull pale ochreous, parallel-sided, only about one-fourth longer than broad, bristles black, scutellum pale. Antennæ nearly twice as long as thorax, dark brown, scape and under side of first few flagellar segments paler; first flagellar segment not longer than broad, second considerably longer, rest gradually lengthened, last few nearly three times as long as broad. *Thorax* blackish, mesonotum slightly shining, with short, dense, uniformly distributed dark pubescence; scutellum with about a dozen black marginal bristles, not very strong. *Abdomen* black above and below, scarcely shining; hypopygium large, somewhat shining black, anal segment projecting much beyond hypopygium, white in colour. *Legs* with coxæ light brownish, middle and hind pairs obscurely dark brown at base and tip; front coxæ with very numerous short black bristles over the whole surface, middle and hind pairs without bristles. Front femora dark brownish, pale at tip; middle femora all blackish; hind femora pale brownish basally, almost black on rather more than the basal half. Tibiæ and tarsi ochreous; spurs black; hind tibiæ at base on inner side with three slender outstanding bristles in a row; rows of fine setulæ on inner side of basal third of hind tibia rather peculiarly arranged; only a few short postero-ventral bristles near middle of hind tibia. *Wings* smoky, more especially on outer half, the tint deepest in cell *R5*, which is darkened right to the base. Halteres yellow, base of knob somewhat darkened.

Length of body, 4 mm.; wing, 4.2 mm.

Lumu Lumu, 1 ♂.

Eumanota humeralis sp. n.

♂. Much resembles *E. leucura*, differing as follows:—*Head* blackish above, ochreous at sides, the colours rather sharply separated. *Thorax* with shoulders and lateral margins of mesonotum ochreous. *Abdomen* with sternites 2—5 ochreous; hypopygium smaller, anal segment less projecting, more yellowish. *Legs* with posterior coxæ not darkened at base; femora mainly light brownish, middle pair somewhat darkened beneath; hind tibiæ without longish bristles at base on inner side, and the rows of setulæ less noticeably irregular in arrangement, but with a more continuous row of minute postero-ventral bristles. *Wings* rather less smoky, outer half scarcely darker than base.

Length of body, 4 mm.; wing, 3.5 mm.

Kenokok, 1 ♂.

Subfamily MYCETOPHILINAE.

Exechia flava White, var.

Marei Parei, 1 ♂.

The specimen is darker than White's type (from Assam), but otherwise very similar; it has much less resemblance to *E. pallidula* Edw. of Sarawak.

Mycetophila lineicoxa Edw.

Lumu Lumu, 2 ♀.

Mycetophila lineola Mg., var. ?

Marei Parei, 1 ♀.

Mycetophila borneana sp. n.

♂. *Head* light brownish, also palpi and first few segments of antennæ, remainder of flagellum dark. Palpi with segments 2 and 3 rather long but thick, 4 longer and slender. *Thorax* brownish, not or scarcely shining, without markings, only pleurotergites darker brown. Five propleural and four strong pteropleural bristles. *Abdomen* dark brown, posterior margins of tergites lighter. *Legs* light brownish; hind femora not darkened at tip, but with a dark brown spot beneath at some distance before the tip. Mid-tibial bristles: 6 dorsal, 1 short subdorsal, 3 external (the basal one quite short), 2 rather long ventral, 7—8 internal. Hind tibial bristles: 4 long and a number of short dorsal, 8 external. *Wings* with strong yellowish ground-colour; a moderately large central brown spot; an oblique and irregular subapical brown band which fills tip of cell *R1* but does not quite extend back to tip of vein *R1;* the band extends on to *Cu1* but is more or less broken up into four separate spots; *fCu* just before *r-m.* Halteres ochreous.

Length of body, 5.5 mm.; wing, 5 mm.

Lumu Lumu, 1 ♂.

This is closely allied to the European *M. ornata* Steph., which has almost the same colouring and chætotaxy, but differs in the hypopygium, especially in the form of the lower style. In the new species this part is rounded (without the ventral arm characteristic of *M. ornata*) and bears on its margin some short black spines (instead of long bristly hairs) one of which is broad and leaf-like.

Delopsis borneensis sp. n.

♀. *Head, thorax* and *abdomen* blackish-brown, only slightly shining; no yellow collar on thorax, and no distinct markings on abdomen, only the fifth tergite obscurely yellowish laterally at base. Palpi and base of antennæ pale. Three strong black propleural bristles. *Legs* yellowish; hind femora with black tips and a narrow dorsal brown line. Mid-tibial bristle-formula 5.0.3.3.1, two of the ventral bristles long. Hind-tibial bristles in three rows, five or six in each row, those in the internal row weaker than the others, but not very small, widely-spaced. *Wings* slightly smoky, slightly more so over base of *Rs* and *r-m*. Costa not produced. Halteres yellow.

Length of body, 3 mm.; wing, 2·8 mm.

Lumu Lumu, 1 ♀.

Among previously described species this most resembles *D. sumatrensis* Edw. and *D. seychellensis* End., differing in the stronger propleural bristles, and in the chætotaxy of the middle and hind tibiæ. When describing *D. sumatrensis* I omitted to state that it has no internal bristle on the hind tibia. *D. seychellensis* has such a bristle; its midtibial bristles formula is 5.0.3.2.1.

Subfamily SCIARINAE.

Trichomegalosphys laticornis (Walk.) (*funesta* End.)

Lumu Lumu. 16 ♂ 8 ♀; Kamborangah 7 ♂ 3 ♀; Kenokok, 2 ♀.

Scythropochroa velata End.

Kiau, 1 ♂.

Scythropochroa rhodogaster sp. n.

♀. A large species with light-coloured abdomen, resembling *S. leucogaster* Edw. (E. Java), but differing as follows:—Thorax more shining; pubescence of anepisternite reduced to two or three hairs or even absent. Abdomen (except for the black eighth segment) light reddish rather than pale ochreous. Tibial spurs more yellowish. Wings rather broader; costal cell rather widened; *R1* very slightly bent down in middle, not quite straight; *R5* distinctly arched and more curved down at tip; costa reaching over three-fourths of the distance from *R5* to *M1;* median fork scarcely shorter than its stem; *Cu1* not uniformly arched but very slightly concave above on its distal half; *An* reaching hardly more than half-way across anal cell; membrane uniformly smoky, scarcely darker towards costa; *R1* and *R5* not distinctly seamed.

Length of body, 6—7 mm.; wing, 6.5—7.5 mm.

Kamborangah, 7 ♀; Lumu Lumu, 4 ♀.

The position of *fCu* is somewhat variable; in some specimens it is slightly before the base of the stem of the median fork, in others distinctly beyond this point. As in *S. leucogaster*, *R1* reaches well beyond *fM* and is almost twice as long as *R*; the branches of *M* and *Cu* are not distinctly darkened; the antennæ are rather slender with the flagellum entirely blackish; the acrostichal hairs are biserial, but do not quite extend to the front margin.

Scythropochroa subfasciata sp. n.

♀. Resembles the preceding, differing as follows:—Antennæ rather shorter, first two flagellar segments under twice as long as broad and yellowish in colour. Thorax less shining; anepisternite bare. Abdomen not entirely reddish, but with the posterior and lateral borders of tergites 1—4 blackish, incisures of other segments also narrowly blackish. Wings with *R1* straight and very little longer than *R*, though reaching beyond *fM*, the difference being due to the somewhat greater distance of *Rs* from the base of the wing; *M1* as long as stem of fork.

Length of body, 6.5 mm.; wing, 7 mm.

Marei Parei, 1 ♀.

Scythropochroa ochrogaster sp. n.

♂ ♀. Resembles *S. leucogaster* and the two new species described above, but much smaller, and also differs as follows:—Face narrower, almost twice as long as broad in ♀. Anepisternite with about three hairs. Abdomen mainly ochreous, in ♂ with segments 7—8, in ♀ with 6—8 and also hind border of 5 blackish; last few segments in ♀ very slender (hypopygium in ♂ small, style rather small, tapering, with three short spines in a vertical row at tip). Tibial spurs longer, on hind legs nearly twice as long as tibial diameter. Wings almost uniformly smoky, darker towards costa in ♀; *R1* very long, reaching nearly to middle of median fork and nearly 2.5 times as long as *R* (rather longer in ♀ than in ♂); median fork as long as its stem, which is faint, as is also the base of *M1*; *An* faint, not reaching middle of anal cell.

Length of body, 4 mm. (♂)—5 mm. (♀); wing 5.5 mm.

Pakka, 1 ♂ 2 ♀.

In two females from Kamborangah *R1* is not quite so long and the median fork shorter; *fCu* beyond instead of before base of stem of median fork. Another female from Kenokok seems to represent another allied species. Some damaged specimens (7 ♂ 1 ♀) in the Sarawak Museum collection labelled "Mt. Kinabalu, alt. 4,500 ft., September 7, 1913," are probably *S. ochrogaster.*

Scythropochroa nigricalcar sp. n.

♀. A large species superficially resembling *S. rhodogaster,* and like it having the head, thorax, and halteres black, abdomen dull reddish with the eighth segment black, legs dark and wings strongly and almost uniformly smoky, but differs as follows:—Antennæ stouter, flagellar segments barely half as long again as broad, with more obvious pubescence. Face broader. Thorax dull, not shining; acrostichal hairs absent and dorso-central hairs shorter; anepisternite bare. Tibial spurs black (hind pair about as long as tibial diameter). Wings with all veins conspicuously darker than membrane, including stem of median fork; *R1* very little longer than *R* (though ending beyond *fM*); base of *Rs* further from base of wing; median fork fully as long as its stem; cubital fork longer, *fCu* below middle of basal section of *M; An* distinct and reaching well beyond middle of anal cell.

Length of body, 8.5 mm.; wing, 9 mm.

Lumu Lumu, 1 ♀.

The four new species of *Scythropochroa* described above all differ from *S. incohata* Ldf. (from an unstated locality in Borneo, alt. 700 m.) in the much more produced costa, fairly distinct basal half of *M1*, and other details of venation.

Trichosia ornatipennis sp. n.

♀. *Head* black, somewhat shining. Eye-bridges three facets wide and almost in contact. Palpi black, rather long, with three distinct segments which are subequal in length though the first is stouter. Antennæ blackish, segments 2 and 3 light brownish; flagellar segments about twice as long as broad. *Thorax* black, somewhat shining, especially on mesonotum; prothorax entirely yellow. Acrostichal hairs absent; dorso-central hairs short and irregularly biserial, almost uniserial in front; scutellum with two rather long hairs and some shorter ones. *Abdomen* slender, with first tergite and first two sternites yellowish, remaining tergites and sternites blackish, with posterior borders narrowly pale. *Legs* with front coxæ and front and middle femora ochreous; posterior coxæ black; hind femora blackish except at base; all tibiæ and tarsi black, or nearly so. Spurs brownish, on hind legs twice as long as tibial diameter. *Wings* with all veins dark, except for stem of median fork, which is faint; ground colour clear, but tip dark brown as far as middle of median fork; also a large dark brown area on hind margin below apical half of *Cu2*. Branches of *M* and *Cu* hairy, also membrane on apical fourth of wing, but few or no macrotrichia in cell *Cu1*. *R1* longer than *R* and ending above *fM;* cubital fork with short stem, very narrow on its basal two-thirds, then much widened; *An* very faint, but reaching margin. Halteres brownish, stem paler.

Length of body, 4 mm.; wing, 4 mm.

Lumu Lumu, 1 ♀.

A very distinct species on account of the conspicuous wing-markings. I refer it provisionally to *Trichosia* on account of the hairy wing-tip, but it is certainly not nearly related to the European species.

Trichosia subnuda sp. n.

♂. *Head* dull black. Eyes practically bare; dorsal bridges 3—6 facets wide and in contact. Palpi black, 3—segmented but short. Antennæ blackish, not much shorter than body; first few flagellar segments about twice as long as broad, rest rather longer; all with dense pubescence which is longer than diameter of segments, and distinct necks which are fully one-third as long as the segments. *Thorax* black, moderately shining, hairs black; acrostichal hairs very few, in one row; dorso-centrals rather long and bristly, uniserial; notopleurals still longer and more bristly; scutellum with 6—8 long marginal bristly hairs. *Abdomen* black, black-haired. Hypopygium small, with no very distinctive features; styles nearly 3 x 1, rounded and finely spinulose at tip. *Legs* ochreous, including all coxæ; tarsi darkened. Hind tibia with about six short externo-dorsal bristles in middle. Spurs pale, longer than tibial diameter. *Wings* moderately and uniformly smoky, posterior veins not very dark; branches of *M* and *Cu* hairy, also most of stem of median fork, as well as membrane on nearly the apical half of the wing; a few macrotrichia present in cell *Cu*, none in anal cell. *R1* rather longer than *R* and ending above or immediately before *fM*, costa long; *fCu* below middle of basal section of *M; An* reaching half-way across cell. Halteres black, base of stem pale.

Length of body, 2.5 mm.; wing, 3 mm.

Kamborangah, 1 ♂.

The combination of practically bare eyes with hairy wings is very unusual.

Phorodonta longipes (Walk.)

Kamborangah, 3 ♀.

This is very similar in colouring and stature to *Sciara ponderosa* Walk.

Phorodonta ruficoxa (Brun.) ?

Several specimens from Kamborangah and Lumu Lumu belong to a *Phorodonta* near *ruficoxa*, but exhibit considerable variation in colour, and more than one species may be represented.

Sciara nigrifemur Edw.

Kamborangah, 1 ♀. Lumu Lumu, 1 ♀.

Sciara ? nigripennis Brun.

Lumu Lumu, 2 ♂ 6 ♀. Kiau 1 ♀.

Sciara lygropis Edw.

Lumu Lumu, 10 ♀; Kabayau, 1 ♀; Kiau, 2 ♀; Tenompok, 1 ♀.

Sciara ponderosa Walk.

Lumu Lumu, 1 ♀.

Sciara ? horrescens Edw.

Lumu Lumu, 25 ♀; Marei Parei, 4 ♀; Kamborangah, 2 ♀.

Sciara politula Edw.

Kamborangah, 5 ♀.

Sciara kinabaluana sp. n. (Fig. 2).

Head black, rather heavily dusted with grey. Eye-bridges of moderate breadth (3—4 facets), not quite in contact. Pubescence of eyes very scanty. Face broad. Palpi long, first visible segment rather swollen, spindle-shaped, last two slender. Antennæ partially alike in the two sexes, slender, black; first flagellar segment 1.5 times, remainder 2—2.5 times as long as broad; necks not obvious; pubescence half as long as diameter of segments. *Thorax* entirely black; mesonotum shining, with short dark hair, acrostichal hairs very small, uniserial, dorso-central hairs irregularly bi- or triserial. *Abdomen* dull dark reddish-brown to black, rather long in ♀. Hypopygium (text fig. 2)

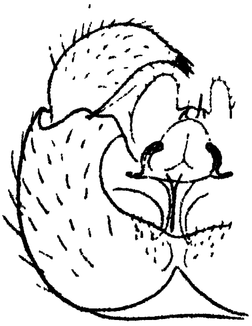

Fig. 2. Sciara kinabaluana sp. n.
♂ hypopygium.

of ♂ moderately large, somewhat swollen; style shorter than the stout coxite, curved and strongly tapering, with a tuft of longish bristles at the narrow tip. *Legs* in ♂ yellowish-brown, in ♀ much darker, almost black, only the front coxæ and femora lighter; tibial spurs yellow. No bristles on tibiæ, the pubescence very short and even. *Wings* smoky, but not very dark, even in ♀. Venation practically alike in the two sexes. *R1* rather longer than *R* and extending distinctly beyond *fM;* costa very long, extending over five-sixths, sometimes even nine-tenths of the distance from *R5* to *M1; M1* longer than stem of fork, which is distinct throughout; *r-m* shorter than basal section of *M;* stem of fork of *Cu* moderate; *An* very short and indistinct. Halteres blackish.

Length of body, 3.5 mm. (♂)—7.5 mm. (♀); wing, 4 mm. (♂)—7 mm. (♀).

Kamborangah, 31 ♂, 28 ♀; Pakka, 1 ♀; Lumu Lumu, 1 ♀.

By my key to the Oriental species of *Sciara* this would run to *S. fraterculа* Brun., which is much smaller, has pale thoracic hair, and is only known in the female sex.

Sciara lamprina sp. n. (Fig. 3).

Head black, scarcely shining. Frons rather high, ocelli well removed from the rather narrow eye-bridges, which are about three facets wide. Face rather narrow. Antennæ completely black, moderately slender; middle flagellar segments in ♂ about three times, in ♀ about twice as long as broad: first flagellar segment noticeably shorter than the rest, second also shorter than third; necks very short; pubescence scarcely as long as the diameter. Palpi black, rather long, the three segments subequal in length. *Thorax* wholly black, mesonotum brightly shining, with some greyish dusting on lateral margins and no shoulders; pleuræ also mainly greyish-dusted. Acrostichal hairs short, uniserial, running whole length of scutum; dorso-central hairs also short, dark, bi- to triserial. Scutellum with about six marginal bristly hairs, not very long. *Abdomen* dull blackish-brown, in ♀ rather long and slender: hypopygium (text fig. 3) in ♂ dark brown, with black styles which are

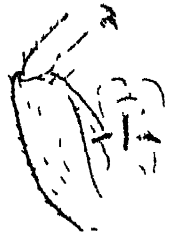

Fig. 3. Sciar[illegible] l[illegible]
sp. n. ♂ [illegible]

rather long, narrow and straight, with three or four spinules at tip, one of which is rather longer and stronger than the rest. *Legs* black, only the tibiæ somewhat brownish; spurs yellowish (1.2.2), slightly longer than tibial diameter; short bristles of hind tibia numerous but not very obviously longer or thicker than the hairs; no distinct hind tibial comb. *Wings* with a faint brownish tinge; posterior veins distinctly darkened (including stem of median fork) and bare. Base of *Rs* ("cross-vein") rather longer than usual, so that basal cell is as broad as costal cell. *R1* noticeably shorter than *R*, but ending only just before *fM;* costa extending four-fifths of the distance from *R5* to *M1; Rs* ending scarcely before tip of *M2; M1* rather longer than stem of fork; cubital fork narrow on basal fourth only, *Cu2* being bent down before middle, stem rather long; *An* short and faint. Halteres black.

Length of body, 3-5 mm.; wing, 3.5—4 mm.

Pakka 4, ♂; Kamborangah, 2 ♂, 1 ♀; Lumu Lumu, 1 ♀.

Perhaps nearer to *S. nitulina* Edw. (Sumatra) than to any other described Oriental species, but differing in shorter and less pubescent antennæ, presence of acrostichal hairs, larger size, etc.

Sciara griseicollis sp. n.

A black species closely resembling the last in all structural details (eyes, antennæ, hypopygium, legs, venation) but differing conspicuously in having the ground colour of the mesonotum completely obscured by coarse grey dust. When seen obliquely from in front the mesonotum appears uniformly grey; from above the area between the dorsocentral hairs is in some specimens faintly shining blackish; from behind there are often faint indications of darker stripes. Acrostichal hairs barely distinguishable. Head dull black. Wings in ♂ (but not of ♀) clearer than in the last species, with posterior veins pale. Legs completely blackish. Abdomen of ♀ less slender.

Length of body, 2.5—3.5 mm.; wing, 2.7—4 mm.

Tenompok Pass, 3 ♂ 10 ♀.

The grey colour of the thorax distinguishes this from all other Oriental species of the genus known to me.

Sciara subbrunnipes sp. n.

♀. *Head* dull dark greyish. Eye-bridges three facets broad and in contact; vertex not much raised. Antennæ blackish, second segment lighter; all flagellar segments, including the first, subequal in length and fully twice as long as broad, middle segments slightly longer than the others; necks absent; pubescence short. Palpi brownish, moderately long, second segment quite twice as long as broad but shorter than third. *Thorax* with surface dull, grey-dusted, somewhat brighter grey on shoulders; as seen from in front or above the mesonotum shows three blackish-grey stripes, the middle one divided (except anteriorly) by a median grey line. Dorso-central hairs all short and pale, bi- to triserial; acrostichal hairs biserial and running almost whole length of scutum but extremely short. Scutellum dull reddish-brown, with rather short pale hairs. *Abdomen* dull brownish, grey-dusted, posterior margins of tergites paler. *Legs* rather light brownish; coxæ blackened at base, but not extensively; tibial spurs yellowish, almost twice as long as tibial diameter. *Wings* with very slight smoky tinge; posterior veins bare, slightly darkened. *R1* slightly shorter than *R* and ending a little before *fM*, costa reaching two-thirds of the distance to *M1*, or rather more; fork even, *M1* rather shorter than stem; cubital fork narrow on almost the basal half, with longish stem; *An* reaching nearly half-way across cell. Halteres more or less pale.

Length of body, 3—3.3 mm.; wing, 3—3.5 mm.

Lumu Lumu, type ♀; Kamborangah, 1 ♀.

This bears a considerable resemblance to the European *S. brunnipes* Mg., differing in the reduced mesonotal pubescence. In *S. brunnipes* longer dark bristly hairs occur mixed with the shorter hairs in the dorso-central series, and the acrostichal hairs are better developed; *R1* is rather longer.

Sciara zygocera sp. n.

♂. Head blackish, somewhat dusted with grey. Eye-bridges four facets wide, median ocellus in contact with bridge. Antennæ longer than the body entirely black; all flagellar segments with long erect pubescence which is about twice as long as the diameter of the segments, and with long necks; first flagellar segment (excluding the neck) half as long again as broad, remaining segments gradually lengthend till they are almost four times as long as broad (again without reckoning the neck). Palpi black; second segment twice as long as broad, third twice as long as second. *Thorax* black, moderately shining; acrostichal hair absent; dorso-central hairs very minute and decumbent; notopleural and scutellar hairs short. *Abdomen* dull black; hypopygium not enlarged; styles short and broad, with a few short spinules on the rounded tip. *Legs* with coxæ and four posterior femora black; tips of front coxæ, front femora and all tibiæ brownish. Tibial spurs yellowish, twice as long as diameter. *Wings* with slight brownish tinge, all veins darkened; posterior veins bare. *R1* shorter than *R*, but ending scarcely before *fM*; costa reaching little more than half way from *R5* to *M1*; *R5* ending above tip of *M2*, fork normal, as long as its stem, but *M1* slightly turned up and *M2* slightly down at tip. Cubital fork narrow on almost the basal half, with rather long stem; *An* reaching half-way across cell. Halteres black.

Length of body, 2.5 mm.; wing, 3 mm.; antenna, 3.3 mm.

Kamborangah, 1 ♂.

By my key to the Oriental species of *Sciara* this would run to *S. microtricha* Edw., from which it differs conspicuously in the form of the antennæ, which are not unlike those of the European *Zygomyia sciarina* Mg.

Sciara lumuensis sp. n. (Fig. 4.)

♂. Closely allied to *S. pahangensis* Edw. (Malaya), which it resembles in colour and structure (broad eye-bridge; rather short antennæ; long costa, pointed base of median fork, etc.), differing chiefly in the form of the hypopygium (text fig. 4): styles subglobular, the three strong spines on their inner margin rather wide apart, one almost apical; ventrally at base of hypopygium is a small finger-like process, which though itself quite bare has a number of hairs grouped round its base.

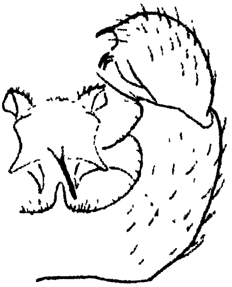

Fig. 4. *Sciara lumuensis* sp. n. ♂ hypopygium.

Length of body, 2.3 mm.; wing, 3 mm.

Lumu Lumu, 2 ♂.

Sciara tenompokensis sp. n. (Fig. 5.)

♂. Closely allied to *S. pahangensis* Edw., differing chiefly as follows: Acrostichal hairs fewer, confined to one row of minute hairs extending over front half of scutum or less. *R1* shorter, ending above *fM* instead of slightly beyond. Hypopygium (text fig. 5) with styles relatively small, but almost globular, the three spines on their inner margin set near the middle, and rather longer; there is no midventral process such as is present in the last species.

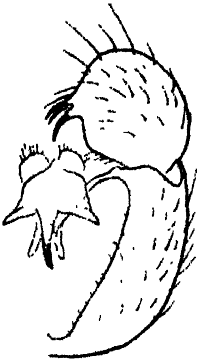

Fig. 5. *Sciara tenompokensis* sp. n. ♂ hypopygium.

Length of body, 2.3 mm.; wing, 3 mm.

Tenompok Pass, 2 ♂.

Sciara pakkana sp. n. (Fig. 6.)

Head dull blackish. Eye-bridges three facets broad and in contact. Antennæ black, rather slender, scarcely longer in ♂ than in ♀, flagellar segments barely 1.5 times as long as broad, with short pubescence and without distinct necks. Palpi light to dark brownish, rather short, first two segments each very little longer than broad, third longer. *Thorax* blackish-grey, not shining. Acrostichal hairs short but distinct, biserial; several rather long black dorso-central bristles present, mixed with shorter dark hairs; three or four long black notopleural bristles (two of which are about as long as half the width of the thorax), also two supra-alars; two long scutellar bristles, besides a few short hairs. *Abdomen* black; hypopygium small; style (text fig. 6) of rather characteristic shape though resembling that of *S. bispinosa* Pettey and *S. diacantha* Edw.

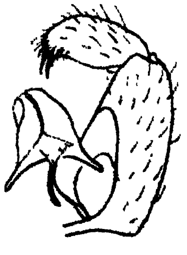

Fig. 6. *Sciara pakkana* sp. n. ♂ hypopygium.

Legs light brownish-yellow; spurs yellow, twice as long as tibial diameter. *Wings* almost clear, posterior veins scarcely darkened and bare; in shape unusually narrow, especially in ♂, with very obtuse anal area. *R1* considerably shorter than *R* and ending well before *fM;* costa reaching almost five-sixths of the distance from *R5* to *M1; R5* ending before level of tip of *M2; M1* rather shorter than stem of fork; cubital fork narrow on its basal two-thirds, with very short stalk; *An* very short. Halteres black, base of stem yellow.

Length of body, 1.5—2 mm.; wing, 2 mm.

Pakka, 11 ♂ 2 ♀.

In the shape and venation of the wing this rather resembles *S. heteroptera* de M. (Java), but the hypopygium is different. *S. bispinosa* Pettey (Philippine Is.) has a rather similar hypopygium but broader wings.

The collection also includes examples of about a dozen other species of *Sciara* showing no very striking characters and at present indeterminable.

Family BIBIONIDÆ.

Plecia fumida sp. n.

♂ ♀. Entirely dull black, including all appendages; thorax of ♀ with a brownish tinge in parts; wings black. Antennal flagellum in ♂ 7-segmented, in ♀ 8-segmented, last two segments not deeply separated, but subequal in size, preceding 4 or 5 sharply separated, especially in ♀, subglobular. No grey dusting on thorax, which is entirely bare above except for a small area of fine decumbent pubescence on each side of median area of scutum in front. Scutum with two deep and narrow furrows, finely rugose on shoulders and sides. A few dark hairs on sternopleura. Hypopygium with tergite divided practically to base into two large triangular lobes; corners of sternite produced, rather pointed, reaching beyond tips of lobes of tergite; styles of moderate size, wide apart, square-ended. Legs rather stout, moderately long, pubescence of tibiæ dense and as long as their diameter; front tibiæ flattened, especially in ♂; first front tarsal segment about 8 x 1. Vein *R4* almost straight, oblique.

Length of body, 5—6.5 mm.; wing, 6.5—9 mm.

Tenompok Pass, 20 ♂ 1 ♀; Lumu Lumu, 2 ♀; Kiau, 2 ♀.

Most nearly related to *P. sordida* Brun., but larger, deeper black, with slightly longer antennæ, stouter tibiæ, and slightly different hypopygium.

Plecia fumidula sp. n.

♂ ♀. An entirely black species resembling the last, but much smaller; antennal segments rather less deeply separated, last segment smaller than penultimate; hypopygium (though of similar type) with styles very small and rounded; legs relatively shorter, first front tarsal segment only about 6 x 1; wings with vein *R4* more sinuous.

Length of body, 3.5—5 mm.; wing, 4.5—5.5 mm.

Kamborangah, 6 ♂ 6 ♀.

Plecia subvarians Walk.

Tenompok Pass, 2 ♀; Kiau, 1 ♂, 1 ♀; Kabayau, 1 ♀.

Bibio flavissimus Brun.

Lumu Lumu, 9 ♂ 16 ♀.

Five of the males have the femora reddish, like those of the females, but in the other four the legs are entirely black. The species has been recorded from Assam and the Philippine Is.; it is of interest to find that the Bornean representative of this group is this species and not *B. rubicundus* v. d. W.

Dilophus rubidus Edw., var.

Lumu Lumu, 1 ♀.

Differs from the type (from Sarawak) in having the front coxæ dark.

Dilophus nigriventris de M., var.

Kamborangah, 47 ♂ 3 ♀; Lumu Lumu, 2 ♂, 1 ♀.

The scutellum is reddish in both sexes, otherwise the body of the male is entirely shining black, as usual; femora yellowish as in ♀. The front tibial spines are slightly different in arrangement from Javan specimens I have examined, but seem to vary somewhat.

Family SCATOPSIDÆ.

Scatopse seminitens sp. n.

♀. Entirely black, including antennæ, palpi, halteres and legs; only the tarsi appearing somewhat lighter owing to brown pubescence. Head, thorax, and last four abdominal tergites brightly shining, basal abdominal tergites, also venter (except last sternite) dull. Antennæ rather stout, short, with 2 + 8 segments as usual. Thorax and abdomen not very broad. Wings as in the European *S. fuscipes* Mg., except that the median fork is broader.

Length of body, 2.3 mm.; wing, 3 mm.

Pakka, 1 ♀.

Differs from other species of the *fuscipes* group in having the dorsal surface of the abdomen half dull and half shining. The other known Oriental species of the group (*S. chalcogaster* Edw. of the Philippine Is.) has the abdomen uniformly shining and the tarsi yellow.

Scatopse (Rhegmoclema) pilosa sp. n.

♂. Closely related to *S.* (*R.*) *lunata* Edw. (Malay Peninsula), with which it agrees in the infuscated wings with a small oblique whitish area immediately beyond end of costa, as well as in venation and other respects. Differs from *S. lunata* as follows:—Pubescence everywhere longer (even on eyes and wings), but most noticeably so on tibiæ, the dorsal surfaces of which are covered with dense pubescence which is longer than the tibial diameter, whereas in the type of *S. lunata* the tibial pubescence is short as usual. Antennal scape brown, not black like the flagellum. Tibiæ wholly black, or with but the faintest brownish translucency at the base. Tarsi wholly clear yellow, contrasting conspicuously with the black femora and tibiæ.

Marei Parei, 1 ♂.

Family ANISOPODIDÆ.

Anisopus borneanus sp. n. (Pl. XII, fig. 5.)

Allied to *A. fulvithorax* de Meij. (Sumatra), which it resembles in having black palpi and antennæ, uniformly dull brown or orange-brown thorax, hind femora without dark ring, second palpal segment very large, and wing-venation and markings of the type of *A. fenestralis*. Differs from *A. fulvithorax* in the much larger dark spot over the tip of the discal cell, this spot extending for some distance into cells *M1* and *M2;* also in having the dark area at the wing-tip uniform in intensity, not distinctly darker towards costa as in *A. fulvithorax* and *A. fenestralis*, and the base of cell *Cu1* more extensively dark. Eyes of ♂ in contact for a considerable distance, facets of upper half noticeably enlarged except behind; ocelli also much larger than in ♀. Last few antennal segments in both sexes fully twice as long as broad. Hypopygium resembling that of *A. cinctus* F., but differing in many details, especially the sharp, sickle-shaped parameres. Wings hairy towards tip only, discal cell bare. Halteres pale.

Wing-length 5.5 mm. (♂)—8 mm. (♀).

Kamborangah, 2 ♂ 2 ♀; Pakka, 7 ♀.

This is one of the numerous representative forms of *A. fenestralis* which are found in the mountainous parts of the Oriental region. The Javan species of this group (*A. javanicus* Edw.) is much more like the European species than is the new form described above.

Anisopus bivittatus sp. n.

♂. *Head* blackish on most of occiput, yellow around mouth-opening. Eyes broadly in contact, upper facets enlarged. Ocelli very large. Antennæ with scape light brownish, flagellum, blackish, moderately long. Palpi wholly dark, second segment moderately swollen. *Thorax* with ground colour of mesonotum yellowish-brown, with two broad blackish stripes running the whole length; no trace of a median stripe. Scutellum and postnotum dark brown. Pleuræ mainly shining blackish, but prothorax and pleurotergite yellow. Abdomen mainly blackish above (perhaps discoloured in type). *Legs* mainly yellowish, including front and hind coxæ; tibiæ and tarsi darker; middle coxæ blackish; all femora very narrowly black at tip; middle and hind femora with a broad dark brown area in middle. First hind tarsal segment slightly swollen. *Wings* with a dark band across middle filling outer end of upper basal cell and base of cell *Cu1*; distal third of wing mainly brown, including two separate clear areas, upper of which just touches costa for a short distance beyond tip of *R2 + 3*. Yellow patch in middle of stigmatic area small, oval. Macrotrichia confined to distal third of wing, discal cell bare. Halteres yellowish.

Length of body, 6 mm.; wing, 6 mm.

Lumu Lumu, 1 ♂.

Although this also belongs to the group of *A. fenestralis*, it is very distinct from all others by the thoracic markings.

Anisopus integratus sp. n.

♀. A blackish species belonging to the group of *A. punctatus* F., which it resembles in having black antennæ with the flagellum thickened at base, black palpi with the second segment not much enlarged, greyish mesonotum with three black stripes, wings with two dark marks in upper basal cell and one near base of cell *R5*, and cell *M1* pointed at base. Differs from *A. punctatus* in having the front narrower, scarcely half as broad again as ocellar tubercle; median thoracic stripe entire, without any trace of a grey central line when seen from in front; dorsocentral and other long bristles of the thorax black instead of yellowish; wings with a general smoky tinge, more intense in apical half of cell *R2 + 3*.

Lumu Lumu, 2 ♀; Kamborangah, 1 ♀.

Anisopus pulchricornis Brun.

Lumu Lumu, 1 ♀.

Family BLEPHAROCERIDÆ.

Blepharocera tetrophthalma sp. n. (**Fig. 7.**)

♀. *Head* of the normal structure for this genus, but upper division of eye more widely separated from lower, the area between the two divisions shining black and covered with very fine pubescence. Hollow below antennæ very slightly dulled with dark grey dust, but fronto-clypeus shining black, with numerous rather long black hairs. A dense patch of black hair on each side of face adjoining base of antenna and extending downwards nearly to lower edge of face, this patch broad above, narrowed to a point below. Labrum about as long as distance from base of antenna to end of fronto-clypeus. Palpi rather rigid in

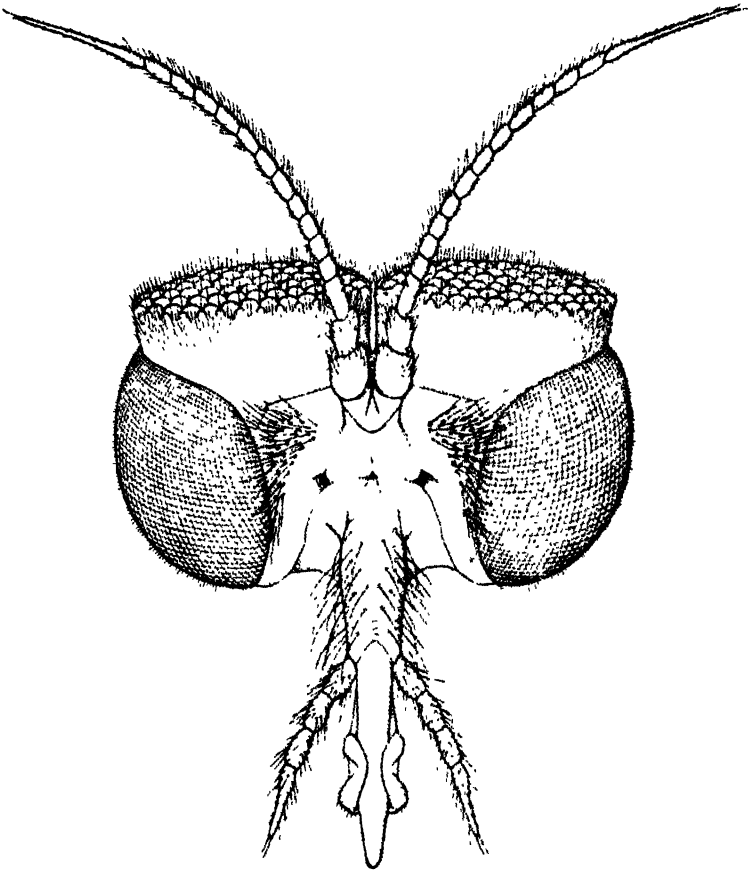

Fig. 7. Blepharocera tetrophthalma sp. n. ♀ Front of head.

appearance, straight, and rather densely hairy, segments 1—3 (or 2—4 if basal portion is counted) each about twice as long as broad, last segment longer and considerably more slender, especially on its distal portion, which varies in length in different specimens and may be very long and slender, resembling the terminal segment of the antenna. Antennæ 15-segmented as usual, 1—3 dark brownish, remainder black; 3 with transverse constriction in middle beneath; 4 slightly broader than long; 5—10 each about as long as broad, 11—14 slightly longer, all with dense pubescence above; 15 long and slender, fully as long as preceding 5 segments together. *Thorax* almost uniformly shining blackish including scutellum and pleuræ, with very slight traces of grey dusting dorsally and no indication of stripes or markings of any kind. Scutellum with the usual small bunch of tiny black hairs on each side. *Abdomen* with distal half of each of segments 2—6 velvety black, proximal half shining dark leaden grey, slightly translucent yellow and with a brownish tinge in some lights. Tip of abdomen black, only cerci yellowish-brown. *Legs* with all coxæ blackish-brown, trochanters mainly yellowish, femora rather narrowly yellowish at base, otherwise dark brown, front pair almost black; tibiæ and tarsi dark brown. All legs shorter than usual. Front femora quite bare beneath on the slender yellow basal portion, densely pubescent on the much stouter black portion, the enlargement of the femur beginning rather abruptly at the point where the tip of the tibia touches the femur when leg is closed. Front tarsus barely as long as tibia. Middle coxa with the process on inner side characteristic of the genus, but this process rather more slender and finger-like than in the other species, densely pubescent like the middle trochanter. Hind femora moderately stout, not reaching beyond end of abdomen when extended backwards. Hind tibia with two minute spurs as usual; hind tarsus considerably shorter than tibia, with at most one or two bristly hairs beneath base of first segment. Claws normal, rather small. *Wings* agreeing with the genotype in shape and venation (*Rs* scarcely longer than *r-m*), but differing conspicuously in having the whole of the membrane between costa and *R1* blackish. Halteres black, base of stem brownish.

Length of body, 7 mm.; wing 6 mm.; hind femur 5 mm.

Kabayau, 8. v. 29; 8 ♀♀. "Resting on a shrub overhanging the Tampassuk River. H. M. P."

The discovery of a species of *Blepharocera* in Borneo is of unusual interest, because hitherto no member of this genus, nor even of the subfamily Blepharocerinæ, has been found in any part of the tropics, the known distribution of the genus including only Europe, North-West India, Japan and North America. The new species, though in all respects a typical *Blepharocera*, differs in many details of structure and colour from any species which I have previously examined, and, so far as can be judged, appears to be equally distinct from any species recently described from Japan. Among its most characteristic features are the more widely separated upper and lower eye-divisions, the shape of the hair patches on the face, the elongate terminal segment of the antenna, the uniformly shining blackish thorax, and the shorter legs.

Although several species of *Blepharocera* have been described, no very satisfactory specific distinctions in the adult have been noted, and I therefore take this opportunity to record some observations on this matter. One of the best distinctions is to be found in the hairs on the face of the female, which, in this new species are dense, black, and in the form of two wedge-shaped patches. In the European *B. cinerascens* the hairs are also black, but occur in a pair of small round patches, conspicuous on the grey-dusted face. In *B. indica* they also form a pair of round patches, but are yellowish in colour. In the North American species the hairs are fewer in number and scattered over a larger area of the face. Other specific distinctions are to be found in the relative lengths of the antennal segments, the extent and amount of the grey dusting on the mesonotum, the colour of the fronto-clypeus, scutellum, pleuræ and coxæ, and the form of the mid-coxal process.

Family CULICIDÆ.

Subfamily DIXINAE.

Dixa rostrata sp. n.

♀. *Head* blackish above, somewhat shining. Proboscis orange, clypeus fully twice as long as its breadth at the base. Palpi and antennal flagellum blackish; first flagellar segment almost cylindrical, about six times as long as broad. *Thorax* with ochreous ground-colour, shoulders extensively dusted with grey; mesonotum with three slightly shiny brown stripes which are just contiguous, median stripe undivided; pleuræ largely brown on upper half, and with a large dull black area occupying the whole of the mesepimeron and extending on to upper part of sternopleura; lower part of sternopleura pale and bare. *Abdomen* dark brown above, pale beneath; cerci elongate and black. *Legs* ochreous; femora very narrowly dark at tip; hind tibia as usual with tip swollen and dark. *Wings* with a large dark cloud in middle round *r-m* and another cloud near base in lower basal and anal cells. Cell *R2* slightly shorter than its stem; *r-m* practically at fork of *R5*; *m-cu* about its own length beyond *r-m;* vein *M* bare above, but setulose below for the greater part of its length, bare at base only. Halteres yellow.

Length of body, 3.5 mm.; wing, 4.5 mm.

Kamborangah, 1 ♀.

This belongs to a small group of species which includes *D. binotata* Edw. (Sumatra) and *D. zeylanica* Senior-White (Ceylon and India), characterised by having the proboscis in both sexes and the cerci of the female unusually long. From the two mentioned the new species differs conspicuously in the markings of the pleuræ.

Subfamily CULICINAE.

Rachionotomyia vicina Edw.

Kamborangah, Lumu and Kiau; a series bred from larvæ from pitcher-plants (*Nepenthes lowii*).

Culex (Culiciomyia) shebbearei Barraud.

Marei Parei, a series bred from larvæ in a large pitcher-plant (*Nepenthes rajah*). There is a slight difference from typical specimens from the eastern Himalayas, the outstanding scales of the male palpi being 3—4 instead of 6—8 in number, and rather narrower; the hypopygium has the same structure.

Megarhinus pendleburyi Edw.

Bull. Ent. Res. xxi, 1930, p. 305.

Kenokok, 1 ♀.

Family CERATOPOGONIDÆ.

Lasiohelea equitans sp. n.

♀. *Head* blackish. Antennæ brown; first eight segments of flagellum scarcely broader than long, last five together slightly shorter than first eight, last with stylet as usual. Palpi and proboscis short, second palpal segment not much swollen. Eyes bare (so far as can be seen in the dry specimen under a magnification of 120). *Thorax* dark brown, not, or scarcely shining; scutum with coarse and uniformly distributed but not very dense light brown hair. Scutellum with four long bristles and at most as many short hairs on margin. *Abdomen* dark brown. *Legs* light yellowish-brown, only the last tarsal segment somewhat darkened. First hind tarsal segment nearly three times as long as second, which is only about twice as long as broad. *Wings* not very densely hairy, with only two rows of hairs between middle of *Cu1* and *M2;* fringe long, near base of wing as long as width of anal area. Costa reaching well beyond middle of wing, almost as far as level of tip of *Cu1;* second radial cell several times as long as first. Halteres yellow.

Length of body, 0.62 mm. (abdomen fully distended); wing, 0.65 mm.

Kiau, 1 ♀.

The specimen has its proboscis inserted into the scutellum of a Tipulid (*Trentepohlia pennipes* O. S.) taken at light. The fact that it is firmly fixed and that the abdomen is distended with food strongly suggests that it was sucking the juices of the Tipulid, and if this was so it is the first record of a Ceratopogonid fly attacking another Dipterous insect much larger than itself. The *Lasiohelea,* however, was not observed by the collector till after the Tipulid was pinned and mounted; moreover, one would not expect it to pierce a hard part like the scutellum.

L. equitans differs from other species of the genus in its smaller size (it is among the very smallest of all Diptera), proportionate lengths of antennal segments, and fewer bristles on the scutellum.

Culicoides klossi sp. n.

♀. Closely allied to *C. gymnopterus* Edw. (Sarawak), which it resembles in form of palpi, colour of thorax and legs, and wing-markings, differing chiefly as follows:—Scutellum with four bristles, one at each lateral corner in addition to the two close together in middle (the lateral bristles were possibly overlooked in the type of *C. gymnopterus*). Wings with the dark spot which crosses the first radial cell much widened above base of median fork; an additional separate dark spot present on margin of wing at anal angle. Second radial cell broader. Macrotrichia of membrane much more numerous round apical margin; in cells *M1* and *M2* two close-set rows of hairs extend back on the folds as far as level of tip of costa, but as in *C. gymnopterus* there are no hairs in the anal area.

Lumu Lumu, 7 ♀.

Culicoides nitens sp. n.

♀. *Head* blackish. Eyes touching. About four long orbital bristles on each side. Antennæ long, brownish basally, last five segments darker. Palpi long, slender, antepenultimate segment almost as long as remainder combined, only slightly swollen beneath beyond middle. *Thorax* shining blackish, with scarcely a trace of grey dusting; humeral pits normal, but less obvious than usual owing to the uniformly shining surface of the mesonotum. Scutellum with four bristly hairs, one at each corner, two close together in middle. *Abdomen* blackish, slightly shining, but less so than thorax. *Legs* with all coxæ dark brown; front femur dark brown, lighter distally; middle femur with proximal two-thirds dark brown, distal third yellow; hind femur blackish except at base; front tibiæ entirely brownish; middle tibiæ yellow on almost the basal half, remainder dark; hind tibia yellow, with a broad dark ring beyond middle; tarsi dark. *Wings* devoid of macrotrichia on membrane or on branches of *M* and *Cu.* Costa reaching to almost three-fourths of the wing length; radial cells united (cross-vein *R2* absent), the combined cell uniformly narrow throughout its length; *R4* + *5* twice as long as *R1*, not noticeably thickened, its tip just extending into the third dark costal mark. Markings well-defined and moderately dark; the usual irregular transverse bands before and beyond the cross-vein, first rather broad (much broader than in *C. gymnopterus*), widened but faint on hind margin of wing, second equally broad, continued broadly to hind margin along *Cu2;* distal fourth of wing mainly dark, including the usual three clear areas, of which the uppermost is large and reaches costa, middle one small and well removed from margin, lower one touching margin; faint dark area on anal angle, otherwise no separate dark spots. Halteres yellowish.

Length of body, 2 mm.; wing, 2 mm.

Marei Parei, 2 ♀.

This is the only species of *Culicoides* known to me in which the thorax is shining blackish. The costa is unusually long, and the absence of the cross-vein *R2* (on both wings of both specimens) is another striking peculiarity; the last feature is also shown by *C. indianus* Macfie and by *C. (Haemophoructus) maculipennis* Macfie. The new species is certainly a true *Culicoides*, and is perhaps nearly related to *C. indianus*, which is smaller and has the rather shorter costa ending in the clear area before the third dark spot.

Dicrohelea dichroa sp. n.

♀. *Head* dark brownish, dusted with grey on vertex and occiput. Antennæ with first eight flagellar segments light brownish, narrowly darkened at tips, scape and last five segments darker. Palpi dark, second segment not much longer than first but about equal to third and fourth together. *Thorax* wholly black, slightly shining; scutum and scutellum with coarse and rather dense decumbent pubescence, no long marginal hairs or bristles on scutellum. *Abdomen* entirely pale dorsally, with very heavy white dusting, and so strongly contrasting with thorax; venter dark brownish. *Legs* with coxæ blackish; front and middle femora and tibia light brownish, knees darkened; hind femur dark brown, with a broad pale subapical ring; hind tibia dark brown on basal third, rest pale yellowish; front and middle tarsi yellowish, hind tarsi wholly white, including last segment. Hind tarsus markedly longer than tibia, the first segment alone not much shorter than tibia, and as usual with two close-set rows of black spinules, second segment with one such row. Pubescence of legs rather long. Fifth tarsal segment of all legs with about four pairs of slender but blunt-tipped spines ventrally. Claws as in other species of the genus: front pair long and equal, posterior pairs very unequal, one very long, the other very short, all with an external barb at base. *Wings* milky-white, all veins pale. Costa nearly reaching wing-tip, and produced a short distance beyond *R5; R5* (from crossvein to tip) three times as long as *R1;* second radial cell five or six times as long as first. Halteres clear yellowish.

Length of body, about 2.5 mm.; wing, 3 mm.

Lumu Lumu, 1 ♀.

This is apparently closely allied to *D. uncinata* Kieff. (Formosa), in which *R5* is said to reach the distal fourth of the wing (it is therefore presumably much shorter than in the present species); the fifth tarsal segment (of all legs ?) is blackish. The other Oriental species described by Kieffer have the abdomen and halteres dark, and differ in other respects.

Palpomyia spinipes Mg., var. ?

Kamborangah, 1 ♀.

Apparently there are no obvious distinctions from this common European species. The front and middle femora are mainly yellowish, with a darker area at the base; in British specimens these parts vary in colour, being usually either all black, or if largely yellowish with the tip and not the base darkened.

Palpomyia pendleburyi sp. n.

♀. Allied to *P. calcarata* Edw. (Philippine Is.), which it resembles in its swollen, spiny front femora and curved front tibiæ, differing as follows:—Eyes above antennæ separated by only the width of one facet. Palpi entirely black. Thorax uniformly light reddish brown. Scutellum with eight marginal bristles. Abdomen with the last two segments dark brown, like those immediately preceding. Apical spine of front tibia shorter, not longer than the tibial diameter.

Lumu Lumu, 1 ♀.

Heteromyia indica Kieff. (South India) may also belong to this group of species, but is very different in colouring, with largely black body and legs, white tarsi and smoky wings. According to Kieffer the front femur in *H. indica* has a ventral groove into which the tibia fits; this groove is not present in the new species.

A second specimen, from Kamborangah, is darker than the type; face, scape, and most of scutum (except shoulders), blackish.

Family SIMULIIDÆ.

Simulium nigripilosum sp. n.

♀. *Head* with frons shining black, with very sparse, short erect black pubescence, bare below, its breadth above about equal to its length. Face densely grey-dusted. Antennæ wholly black, rather stout. Palpi black, rather short. *Thorax* wholly black; mesonotum slightly and almost uniformly shining, with a barely perceptible greenish lustre, with little trace of grey dusting except when viewed from in front or from side; pleuræ almost uniformly grey-dusted; scutellum dull black. Mesonotal pubescence fine, blackish, uniformly distributed except on and in front of scutellum, where there are some sparse erect black hairs but no decumbent pubescence. *Abdomen* black, with the usual grey dusting on tergite 2; tergites 3—5 all small, dull black, 6—8 large, shining; pubescence very scanty, black; basal fringe short and black. *Legs* black, including all coxæ and femora and whole of front and middle tibiæ and front tarsi; front tibia distinctly silvered on outer side; hind tibia with integument narrowly yellow at base, silvered dorsally for nearly half their length; middle tarsi with basal two-thirds of first segment and a narrow ring at base of second segment yellow; hind tarsi with rather more than basal half of first segment whitish. Pubescence of legs all black. Front tarsi moderately wide; first segment fully 5 x 1; third segment (as seen from side) nearly twice as long as its greatest breadth. Calcipala rather larger than usual in this group. Claws simple, without sub-basal tooth. *Wings* with normal venation; hair at base black; basal section of radius bare. Halteres orange, stem mostly blackish.

Wing-length, 3 mm.

Kamborangah, 7,000 ft., 26. iii. 29, 1 ♀.

This species shows a greater resemblance to *S. fuscopilosum* Edw. (Malay Peninsula) than to any other described Oriental *Simulium*, but differs in its simple claws, finer mesonotal pubescence, dark front coxæ and anterior tibiæ, more extensively dark hind tibiæ and more extensively yellow middle basitarsi. *S. iridescens* de Meij. (Java and Sumatra) and *S. melanopus* Edw. (Philippine Is.), though similar in colouring to the new species are less closely allied, as they have the fifth abdominal tergite larger and shining.

A male from Marei Parei probably belongs to this species. It has the usual large perlaceous shoulder-patches;

legs mainly black, only mid and hind basitarsi obscurely yellowish on basal third; hind basitarsus broad.

A female from Tenompok Pass is rather smaller than the type and has the base of the antennæ reddish and the front coxæ yellow; it perhaps represents another allied species.

Simulium crassimanum sp. n.

♀. Closely resembles *S. nigripilosum*, differing chiefly as follows:—mesonotum more distinctly shining. Front tarsi decidedly broader; as seen in side view the basitarsus appears scarcely four times as long as its greatest breadth and the third segment very little longer than broad. Middle tarsi with the first two segments mainly yellow, only narrowly dark at tips; third segment also yellowish at base. Hind basitarsi with fully the basal two-thirds whitish. Wing-length, 2.5 mm.

Kamborangah, 2 ♀.

Another ♀ from Lumu Lumu is similar, but has the antennal scape reddish and the front coxæ pale.

Simulium aeneifacies sp. n.

♀. Closely resembles *S. nigripilosum* in most characters, including form of front tarsi, differing chiefly as follows:—Face shining dark-greenish, without grey dusting, and apparently relatively smaller. Antennæ reddish at base. Thorax more shining. Front coxæ yellow; middle as well as hind tibiæ narrowly yellowish at base. First two segments of middle tarsi mainly yellowish, darkened at tips only. First segment of hind tarsi whitish on at least the basal two-thirds. Wing-length, 2.5 mm.

Kamborangah, 1 ♀.

Simulium laterale sp. n.

♀. Closely resembles *S. nigripilosum*, differing chiefly as follows:—Mesonotum with a rather broad band of green to bronze iridescence on each side, the two bands bent inwards near the front margin; this iridescence is most distinct in side view, and in other aspects the iridescent area is either not clearly marked or is replaced by dull-blackish. Dorsal pubescence of second front tarsal segment (and on tip of first) rather longer and coarser. Hind tibia almost completely black, the yellow ring at base indistinct. Middle tarsi black, with basal half of first segment yellow. Hind tarsi with basal half of first segment whitish. Wing-length, 3 mm.

Lumu Lumu, 2 ♀.

Simulium fuscinervis sp. n.

♂. A large dark brown species without special ornamentation, closely related to *S. senile* Brun. (W. Himalayas) and *S. feuerborni* Edw. (Java and Bali), and like those species having the front tarsi unusually long and slender and the hind basitarsus (in ♂) about as long as the tibia and decidedly broader; differs from both in having the branches of *M* and *Cu* distinctly darkened, almost as dark as the costa. Hind tibia with only a few long hairs dorsally (much less hairy than in *S. feuerborni*). Hypopygium differing slightly from both the species mentioned; style with a moderate-sized terminal spine (in the type two such spines are present on one style; in *S. feuerborni* the spine is very stout, in *S. senile* it is absent); parameral structures each with about ten long, sharp teeth. Hind basitarsus uniformly brown, as in *S. feuerborni* (not bicoloured as in *S. senile*), but more widened at tip.

Pakka, 1 ♂.

Family PSYCHODIDÆ.

Nemopalpus unicolor sp. n.

♀. Closely allied to *N. orientalis* Edw. of Malaya, differing as follows:—Antennæ uniformly light brown, hairs more yellowish. Palpi rather shorter, second and third segments more slender, almost cylindrical. Wings with the long hair on the veins uniformly light brown, not obviously darker on *Cu* and neighbouring veins. Venation: *Sc* ending above fork of *R4 + 5*; *Sc1* absent, *Sc2* very faint; *Rs* more curved; stem of *M1 + 2* scarcely as long as *r-m*; *An* rather sinuous and running rather nearer hind margin.

Length of body, 4 mm.; wing, 4.5 mm.

Lumu Lumu, 1 ♀.

In describing *N. orientalis* I omitted to state that the segments of the antennal flagellum (except the first two) are distinctly darkened at the base; the second palpal segment is slightly enlarged at the tip beneath, and the third is rather stout; the stem of *M1 + 2* is about twice as long as *r + m*.

Family TIPULIDÆ.

Subfamily LIMONIINAE.

Limonia longivena Edw. (*multinodulosa* Alex.)

Lumu Lumu, 1 ♂.

This specimen differs from the type male of *L. multinodulosa* Alex. (from Luzon) in having the front and middle tarsi entirely dark, but there seems to be no other difference. The type of *L. longivena* (a female from Ceylon) although smaller than the Philippine male agrees well with it in colouring and is no doubt conspecific; a similar female is in the British Museum from Selangor. The third and fourth front tarsal segments of the female are somewhat swollen.

Limonia nongkodjadjarensis de Meij.

Marei Parei, 3 ♀; Kamborangah, 1 ♀.

I am indebted to Prof. J. C. H. de Meijere for the loan of the type of this species, and can add the following details to his description:—Front at its narrowest point about as wide as three facets. Flagellar segments somewhat narrowed apically but shortly pubescent throughout, without bare necks; one long dorsal hair. Pronotum rather long, dark brown. No black pit behind front coxa. About 6—8 hairs on sternopleura and two on hypopleura; two below and just before base of wing, but none on mesepimeron. Dark border to cross-veins less distinct than shown in figure. Claws with strong tooth. Hypopygium with tergite produced into two triangular lobes; no dorsal style; ventral style rather large, swollen, with a long and rather slender rostrum which is bent beyond the middle, with a single rather slender spine arising from the bend, and with a strong black spine borne on a curved process arising from base of rostrum; parameres long, blackened, rounded at tip.

A male in the British Museum from Pahang agrees rather closely with the type, differing only slightly in the shape of the rostrum of the style. The females from Mt. Kinabalu seem certainly conspecific; they have the extremely short cerci characteristic of the closely allied Formosan species *L. alticola* Edw. and *L. koxinga* Alex.

Limonia biceps Alex.

Pakka, 3 ♂; Marei Parei, 1 ♂.

This belongs to the same group as *L. nongkodjadjarensis*, differing slightly in the hypopygium and more definitely in the male antennæ, which are more slender, with two very long hairs on each flagellar segment. It may be that either *Dicranomyia fortis* Brun. (India) or *D. alticola* Edw. (Formosa) is an earlier name for this species.

Limonia mjöbergi Edw.

Lumu Lumu, 1 ♀.

Limonia sp. indet.

1 ♀ Lumu Lumu; 8 ♀, Kenokok; 1 ♀, Marei Parei.

Limonia alta de Meij.

Kenokok, 1 ♂; Kamborangah, 5 ♀; Pakka, 2 ♀.

I am also indebted to Professor de Meijere for the loan of the type of this species, and though it is now badly damaged I am satisfied that the above-mentioned specimens from Borneo are conspecific. The following details may be noted:—Front broad and distinctly silvery as viewed from above. Antennal flagellum in ♂ with pubescence as long as the diameter, but no trace of verticils; segments nearly cylindrical, first two or three each about five times as long as broad. Palpi well developed. Pronotum rather small. A small black pit on sternopleura just behind base of front coxa. Three longish hairs on upper part of mesepimeron just below wing-base; 1—2 sternopleural hairs. Abdominal tergites dark; sternites black basally, with moderately broad greyish apical bands. Claws simple. Hypopygium of *Dicranomyia* type, with tergite simple; coxite small; ventral style very large and fleshy, with one short, thick spine on the short rostrum.

The thoracic characters noted above apply to both sexes. The female has the antennæ much shorter, with short verticils in addition to very short pubescence; cerci normal, of moderate length.

Limonia (Limonia) lateromacula sp. n. (Pl. XII, fig. 8.)

♂. *Head* blackish, somewhat dusted with grey. Front moderately narrow. Antennæ, palpi and rostrum blackish. Flagellar segments elongate oval, with short verticils. *Thorax* with ground-colour ochreous. Mesonotum scarcely shining, with three small rounded dull black spots on the margin, one on the pseudosuture, one on præscutum shortly before suture, and one on scutum immediately behind suture; præscutum with a pair of brown areas in middle posteriorly; scutal lobes largely blackish, also postnotum. Sides of thorax with three oblique blackish stripes, somewhat interrupted; one extending along side of the large pronotum and continued to wing-base; second from front coxa to middle of pleurotergite; third from sternopleura and middle coxa to below base of haltere. *Abdomen* dark brown, posterior margins of tergites lighter. Hypopygium with a single style which has a pair of short spines placed close together on the outer margin of the swollen basal portion; tip produced inwards and narrowly blackened. *Legs* mainly dark brownish; hind coxæ and basal half or more of all femora ochreous; tips of femora black, preceded by a yellow ring. Claws with a long median tooth preceded by one or two smaller teeth. *Wings* (pl. xii, fig. 8) with ground colour whitish, but most of surface occupied by brown clouds which form four or five irregular cross bands, stigma darker brown. Tip of *R1* somewhat longer than *r*; *m—cu* well before base of discal cell. Halteres with dark knob.

Length of body, 5 mm.; wing, 7 mm.

Lumu Lumu, 1 ♂.

The very distinctive pattern of the thorax distinguishes this from allied species such as *L. nitobei* Edw. and *L. esakii* Alex. (Formosa).

Limonia (Limonia) chaseni sp. n. (Pl. XII, fig. 6.)

♀. *Head* brownish-ochreous, front considerably darker than occiput, rostrum light ochreous and quite short. Antennæ black; flagellar segments elongate oval, with short verticils. *Thorax* with ochreous ground-colour, mesonotum with surface dull; præscutum with a broad median stripe somewhat darker, lateral margins also darkened behind pseudosuture; scutal lobes, scutellum and median area of postnotum dark brown. A dark brown stripe on pleuræ from pronotum to base of haltere, lower part of sternopleura also darkened. *Abdomen* brown, posterior margins of tergites broadly ochreous, cerci moderately long. *Legs* brownish, tibiæ and tarsi lighter than femora, but last three tarsal segments dark. *Wings* (pl. xii, fig. 6) with ground nearly clear, veins pale; dark markings as figured. *Rs* long, angled at base; *m—cu* much before base of cell. Halteres ochreous, base of knob darkened.

Length of body, 4.5 mm.; wing, 6.5 mm.

Kamborangah, 1 ♀.

Sufficiently distinguished by wing-markings from any other species known to me, especially by the presence of dark clouds at the tips of *R2 + 3* and *Ax*.

Limonia (Limonia) pacatina sp. n. (Fig. 8.)

♂. *Head* blackish, dusted with brownish-grey; rostrum, palpi and antennæ black. Eyes practically touching. Antennæ about as long as thorax, flagellar segments elongate-oval, verticils not longer than segments. *Thorax* almost uniformly brownish-ochreous above, præscutum indistinctly darker in middle, surface dull but without dusting; pleuræ with a broad but very ill-defined darker brown stripe from neck and front coxa to base of abdomen. *Abdomen* blackish. Hypopygium (text fig. 8) with a single style, which is simple in form, with swollen base and long, slender terminal portion; tergite somewhat produced in middle,

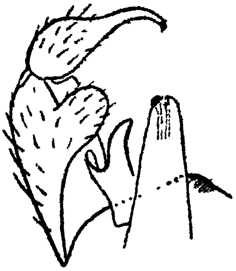

Fig. 8. *Limonia* (*L.*) *pacatina* sp. n. ♂ hypopygium.

Legs brownish, posterior coxæ and bases of femora ochreous, tips of femora also indistinctly paler. Claws with one long median tooth. *Wings* rather broad, with slight brownish tinge, veins somewhat darker, stigma dark. *Sc* ending just beyond middle of *Rs*, which is gently curved; *Sc2* at tip of *Sc*; tip of *R1* turned up at *r*; *m—cu* at base of cell. Halteres dark brown.

Length of body, 6 mm.; wing, 7.5 mm.

Kamborangah, 5 ♂; Lumu Lumu, 2 ♂.

Though superficially resembling *L. nongkodjadjarensis* de Meij. this is very distinct in antennal and hypopygial characters. It seems to be closely related to *L. pacata* Alex. and *L. subpacata* Alex. (Philippine Is.) differing in the longer *Sc*, form of ninth tergite, etc.

Limonia (Limonia) negativa sp. n. (Fig. 9.)

♂. Allied to *L. luteivittata* Alex. (Luzon), which it resembles in the peculiar præscutal adornment of yellowish stripes on a dark brown ground, the median yellow stripes extending the whole length, lateral stripes abbreviated; differs from the Philippine species as follows:—*Head* rather light brownish instead of black; front rather narrower, being decidedly less than twice the width of one scapal segment. *Wings* not at all darker at tip, though with general dark ground and other markings as described for *L. luteivittata*. Hypopygium (undescribed in the case of *L. luteivittata*): ventral process of coxite arising from base, rather long, hairy, slightly swollen apically, with a terminal lobule. Ventral style rather small, of peculiar form as figured (text fig. 9).

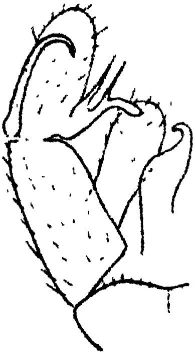

Fig. 9. *Limonia* (*L.*) *negativa* sp. n. ♂ hypopygium.

Length of body, 5 mm.; wing, 7.5 mm.

Lumu Lumu, 1 ♂.

In this species the rostrum is extremely short, scarcely produced beyond the rest of the head, and the palpi are formed of a single segment, as in *L. citrofocalis* Edw., a species with very different colouring.

Limonia (Dicranomyia) punctulata de Meij.

Kiau, 4 ♂ 1 ♀.

These specimens belong to the typical form of *L. punctulata* as recently restricted by Alexander.

Limonia (Dicranomyia) subpunctulata Alex.

Marei Parei, 4 ♂ 1 ♀; Kamborangah, 1 ♂.

The exact form of the hypopygium shows some variation in the two specimens mounted, but in both the rostral prolongation is rather shorter than is shown in Alexander's figure of the type (from Formosa) and the two short spines are well removed from its base.

Limonia (Dicranomyia) convergens de Meij.

Kamborangah, 1 ♂.

Limonia (Dicranomyia) sordida Brun.

Kamborangah, 14 ♂ 3 ♀; Marei Parei, 3 ♂ 4 ♀; Pakka, 1 ♀; Lumu Lumu, 1 ♀.

The specimen from Lumu Lumu shows some particularly interesting features of venation; the discal cell is open on both wings, being coalescent on one wing with cell *M1* and on the other with cell *M3*.

Limonia (Alexandriaria) frontina sp. n.

♀. *Head* black, slightly shining above, with silvery-grey dusting round eye-margins: front rather broad, conspicuously silvery-grey. Rostrum short, light brownish; palpi and antennæ black; flagellar segments shortly oval. *Thorax* with integument wholly black; mesonotum rather brightly shining, but with large areas of silvery-grey pruinescence on sides of præscutum from suture nearly to front margin. Pleuræ as seen from above wholly silvery-grey. *Abdomen* blackish above, paler below. Cerci of moderate length. *Legs* pale brownish. *Wings* greyish, unmarked except for the faint stigma. *Sc* short, ending well before base of *Rs*, which is very short and obtusely angled. Halteres dark brownish.

Length of body, 4 mm.; wing, 5 mm.

Marei Parei, 1 ♀.

Differs from *L. simplissima* Alex. (Java) and *L. brevissima* Alex. (Luzon) in the silvery frons and blackish integument of pleuræ. Although referred to the artificial group *Alexandriaria* it perhaps belongs more correctly to the *morio* group of the subgenus *Dicranomyia*.

Limonia (Dicranomyia) fulvomorio sp. n. (Fig. 10).

Head dull dark brownish above, front conspicuously silvery and rather broad. Rostrum short, yellowish. Palpi black, with three or four distinct segments. Labium black. Antennæ entirely black, alike in the two sexes, rather shorter than thorax, flagellar segments oval, with short verticils. *Thorax* rather light ochreous brown, mesonotum almost uniformly shining and unmarked; pronotum dark brown. Pleuræ slightly darkened on upper half, with a conspicuous stripe of silvery pubescence from neck to below wing-base, and a large silvery area below middle of sternopleura. *Abdomen* dark brown, posterior margins of tergites broadly paler, in ♀ segments 1—2 almost all pale. Hypopygium of characteristic form (text-fig. 10); tergite with two small, widely separated knobs; ventral style small; a single long rostral spine. *Legs* dark brownish, including all tarsi; coxæ, trochanters and base of femora ochreous. *Wings* with slight brownish tinge, unmarked except for the stigma, which is distinct and dark brown. *Sc* ending above base of *Rs*; *Sc1* very long; *Rs* long, only slightly curved; anal area rather small. Halteres black.

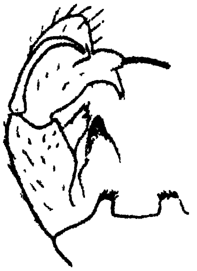

Fig. 10. *Limonia* (D.) *fulvomorio* sp. n. ♂ hypopygium.

Length of body, 6 mm.; wing, 7 mm.

Pakka, 1 ♂; Kamorangah, 1 ♀.

I am unable to point out any close ally of this species. It seems to belong to the *morio* group, differing from other members of this group in the brown instead of black thorax.

Limonia (Geranomyia) melanocephala Edw. (*phoenaspis* Alex.).

Kamborangah, 2 ♂ 2 ♀.

Limonia (Rhipidia) griseipennis Edw. (? = *javanensis* de M.)

Kamborangah, 1 ♀.

Limonia (Rhipidia) spadicithorax Edw.

Kenokok, 1 ♀.

This specimen agrees with the types of *Dicranomyia spadicithorax* Edw. (from the Seychelles Is.) in the following particulars:—Antennæ with the first three segments dark, remainder alternately light and dark. Mesonotum, except for a narrow margin to præscutum, but including scutellum and postnotum, wholly deep chestnut or blackish-brown, velvety in appearance, strongly contrasting with pale yellowish pronotum and upper part of pleuræ. The broad blackish pleural stripe continued on to first abdominal segment, which is almost wholly coloured like the mesonotum. All femora broadly dark at tips, dark area broader and sharper on front femora (extreme tip of middle and hind femora indistinctly lighter). Front and hind tibiæ and tarsi entirely blackish, middle tibiæ brownish, rather narrowly blackened at base and tip. Hind femora without any modified hairs posteroventrally (a very similar West African species has a long row of black hairs in this position).

Other similar specimens are in the British Museum from India, Java, and Malay Peninsula.

It is probable that *L. spadicithorax* may be a synonym of *L.pulchra* (de Meij.), but this is not certain as recent experience has shown that there are certainly several closely allied but distinct species of this group in the Oriental region and others in Tropical Africa. Another form which appears to be widely distributed in the Orient differs slightly from the above in having the front and hind tibiæ brownish, only narrowly black at tips; this form is probably only a variation of the above. De Meijere's type of *R. pulchra* (from Tosari, Java), had only one (middle) leg left and was stated to have antennæ yellowish (no dark rings being mentioned). It is of interest to note that the Seychelles form is one of the Oriental species and is not identical with any of the three African species of the group at present known to me.

I have elsewhere quoted *Dicranomyia marmoripennis* Brun. as a synonym of *R. pulchra,* and some specimens so determined by Brunetti certainly agree with those described above, but the original description is at variance in several particulars and was probably compiled from a mixed series, the type perhaps belonging to another species.

Limonia (Rhipidia) xanthoscelis sp. n.

♀. Resembles *L.* (*R.*) *spadicithorax* Edw., as regards markings of antennæ and wings and general colouring of body, differing as follows:—Thorax more reddish-brown dorsally, scutum and scutellum darker; postnotum with the distal half orange, contrasting with the velvety-black first abdominal segment. Legs entirely yellow, without trace of dark rings even on front femora, only last two tarsal segments darkened.

Pakka, 1 ♀.

Limonia (Rhipidia) pictipennis Edw.

Kamborangah, 11 ♂ 5 ♀; Pakka, 3 ♂ 2 ♀; Marei Parei, 1 ♂.

In several of the females and in one male the white centres of the dark costal areas are lacking.

Limonia (Rhipidia) impicta sp. n.

♂. Head blackish, dusted with grey. Front moderately wide. Rostrum black, about as long as remainder of head. Antennæ black, except for necks of flagellar segments, which are yellowish and fully as long as the oval basal portion; each flagellar segment except the first two and the last two with two pubescent processes ventrally which are about as long as or slightly longer than the segment itself (including the neck), and with two rather long dorsal hairs. *Thorax* blackish, dusted with grey, especially on pleuræ; lower part of sternopleura more brownish. *Abdomen* black, posterior margins of segments greyish. Hypopygium without very distinctive features; rostrum with two long spines. *Legs* uniformly light brownish. Claws with a small basal tooth. *Wings* rather smoky, with the tip, stigma, and clouds on base and tip of *Rs* darker, areas on each side of stigma clear. *Sc* ending above base of *Rs*; *Sc2* far before tip of *Sc*; *Rs* obtusely angled; discal cell confluent with cell *M1*. Halteres blackish.

Length of body, 4 mm.; wing, 5.5 mm.

Marei Parei, 1 ♂.

Differs from other members of the *rostrifera* group in the much shorter antennal pectinations; the slight wing-markings are also distinctive.

Limonia (Libnotes) sumatrana Edw. (*stantoni* Edw., var. ?).

Lumu Lumu, 23 ♂ 3 ♀; Kenokok, 3 ♂ 2 ♀; Marei Parei, 1 ♂.

Limonia (Libnotes) limpida Edw.

Marei Parei, 1 ♂; Lumu Lumu, 1 ♀.

Limonia (Libnotes) neofamiliaris Alex.

Lumu Lumu 1 ♂.

In this specimen the tip of *Sc* is distinctly swollen, as in the closely related *L. subcostalis* Edw. of Buru; Alexander does not mention this point.

Limonia (Libnotes) subfamiliaris Alex.

Kabayau, 1 ♂.

The tip of *Sc* is not in the least swollen.

Limonia (Libnotes) aurantiaca Dol.

Kenokok, 1 ♂.

This specimen differs from specimens in the British Museum (from Buru) chiefly in having no obvious darkening at the tips of the femora. *L. illecebrosa* Alex. (Luzon) is very closely allied, but differs (according to the description) in having the rostrum and base of antennæ dark brown instead of yellowish.

Limonia (Libnotes) kinabaluana sp. n. (Pl. XII, fig. 7).

Closely allied to *L. alexanderi* Edw. (Java), with which it agrees in having the knob of the halteres dark, differing chiefly as follows:—Antennal flagellum black or blackish. Scutellum entirely pale; postnotum also scarcely darkened. Middle and hind coxæ not darkened. Black marks on sides of abdominal tergites less obvious. Hypopygium differing slightly, especially in having the slender distal portion of the rostrum rather shorter as compared with the stouter proximal portion. Wing-markings (though similar in arrangement) less extensive, dark areas on veins forming broad streaks rather than patches.

Length of body, 11—13 mm.; wing, 15—18 mm.

Kemborangah, 8 ♂ 4 ♀; Pakka, 1 ♂; Lumu Lumu. 1 ♂.

From the somewhat similar *L. sumatrana* Edw. and *L. scutellata* Edw., this differs not only in the dark knob of the halteres, but also in the more pollinose thorax and the absence of a black spot in the upper corner of the anepisternite, as well as in details of venation and wing-markings.

Limonia (Libnotes) pilulifera sp. n.

♂. *Head* blackish, without obvious grey dusting (but perhaps discoloured). Front about as wide as two or three facets. Rostrum and palpi black. Antennæ almost as long as the whole body; scape dark brownish; flagellar segments with base almost globular or very little longer than broad, and long slender necks which are considerably longer than the basal portion, in most cases nearly twice as long; the globular portion bearing very long erect pale pubescence which is longer than the whole segment (including the neck); one black dorsal hair (representing the verticil) is slightly thicker but somewhat shorter than the others. *Thorax* brownish-ochreous, præscutum with a rather ill-defined darker median stripe; pleuræ unmarked. *Abdomen* blackish, unbanded. Hypopygium with coxites long, much longer than the small styles; latter constructed somewhat as in *L. perparvula* Alex.; parameres long but stout, flattened and deeply grooved externally, somewhat spatulate with pointed tip; penis stout, not obviously divided at tip. *Legs* very slender, brownish, tips of femora indistinctly yellow. *Wings* clear, with small, faint stigma; macrotrichia of veins longer than usual. Venation as in *L. perparvula* Alex., except that *Rs* is much longer and gently curved. Halteres black.

Length of body, about 4.5 mm.; wing, 6 mm.; antenna, about 4 mm.

Kenokok, 1 ♂.

This seems to be nearly related to *L. perparvula* Alex. (Luzon), but is very distinct from that species and from all known to me in the form of the antennæ. *L. tenuiclava* Alex. (Mindanao) is evidently also closely related, but has the antennæ less elongate.

Limonia (Discobola) argus Say.

Pakka, 1 ♂; Kamborangah, 2 ♀.

This North American species has already been recorded by Alexander from Japan, Formosa and Luzon. The present specimens agree entirely with North American examples in the British Museum (from Amherst, Mass.) as regards wing-markings and structure of hypopygium, as well as in the entirely black antennæ and colour of halteres, but differ in having no dark stripes on the præscutum and no trace of darkening on the posterior borders of the abdominal tergites; the scutellum is entirely pale and the postnotum scarcely darkened.

Limonia (Discobola) parargus sp. n. (Pl. XII, fig. 9.)

Closely allied to *L.* (*D.*) *argus*, and with practically identical wing-markings, but differing as follows:—Antennæ with second segment clear yellowish. Præscutum unmarked, but scutal lobes blackened posteriorly, scutellum blackish except at base, pleurotergites mainly blackish, mediotergite also darkened. Front and middle coxæ dark brown in front, not all yellowish as in *argus*. Femora with obvious indications of a second dark ring, in addition to the normal subapical black ring, the yellow area between the two dark rings broader than either of these and decidedly broader than the yellow tip. Tibiæ with an ill-defined darker ring close to base. Abdomen unbanded, but with blackish marks on sides of tergites. Hypopygium with margin of tergite produced into two slight lobes, which are very widely separated; fleshy style somewhat longer than broad (not almost globular as in *argus*), the two very short rostral spines sessile, not set on a tubercle. Wings (pl. xii, fig. 9) with vein *R1* more sinuous.

Marei Parei, 1 ♂; Lumu Lumu, 2 ♀.

This seems to be somewhat intermediate between *L. argus* and *L. taivanella* Alex. (Formosa), at least as regards hypopygial structure. It differs from *L. taivanella* as well as from *L. moiwana* Alex. (N. Japan) in having no separate spots in cell *M*, and in other respects. In the specimens before me the basal section of *R4* + *5* is continuously seamed with black, whereas in the Bornean specimens of *L. argus* there is a small separate dark spot on the fork of *Rs*.

Limonia (Discobola) epiphragmoides sp. n. (Pl. XII, fig. 10.)

♂. *Head* black, including rostrum and palpi. Antennæ with first segment black, second yellowish, third brownish yellow, remainder all yellowish. *Thorax* light brownish yellow, unmarked except that the pronotum is dark brown laterally; the præscutum also somewhat darkened on margin. *Abdomen* light-brownish, lateral margins of tergites somewhat darkened. Hypopygium of very distinctive form; tergite with two small, rounded, sub-contiguous lobes; dorsal style pale; ventral style with the fleshy area very much reduced, the two rostral spines pale and blunt-tipped as in *L. argus*, but very long and inserted far from the rostrum, near outer margin of the style, and directed straight backwards. *Legs* uniformly yellowish, femora with faint traces of a very narrow subapical dark ring. *Wings* (pl. xii, fig. 10) with an elaborate and very distinctive pattern somewhat reminiscent of *Epiphragma*. Tip of *R1* much more looped than in *argus*; *m-cu* well beyond base of cell. Halteres entirely yellowish.

Length of body, 6 mm.; wing, 8 mm.

Lumu Lumu, 1 ♂.

Very distinct in wing-markings from all other species of the subgenus.

Antocha (Antocha) retracta sp. n.

Head light ochreous, somewhat dusted with grey, especially round eye-margins. Front nearly as broad as one eye. Antennæ alike in the two sexes, noticeably shorter than thorax; scape ochreous, flagellum brownish; second scapal segment enlarged; flagellar segments rather shortly oval, with short verticils. Rostrum ochreous, palpi blackish. *Thorax* dull ochreous; in ♀ with scutum largely dark brown (dark area formed by the almost complete fusion of four ill-defined stripes), scutal lobes mainly dark, also postnotal mediotergite and lower part of sternopleura; in ♀ the scutal lobes only are somewhat darkened. *Abdomen* brownish-ochreous, genitalia paler. *Legs* light brownish. *Wings* slightly milky as usual; veins not very dark; stigma absent.

Macrotrichia numerous on distal part of *R4* + *5* and branches. Cross-vein *r* placed at extreme tip of *R1* and less than twice its own length beyond fork of *Rs*; *m-cu* rather oblique and fully its own length before fork of *M*. Halteres pale, knob somewhat darkened.

Length of body, 4—5.5 mm.; wing, 5.5—7 mm.

Kamborangah, 1 ♂ 1 ♀.

Differs from most other species of the subgenus known to me in the unusually retracted position of *m-cu*, in this respect approaching the subgenus *Orimargula*, and resembling *A. thienemanni* Alex. (Java), from which it differs in colouring.

Antocha (Orimargula) maculipleura sp. n.

♀ *Head* black, heavily dusted with grey. Front scarcely half as broad as one eye. Antennæ slightly shorter than thorax, first segment light brownish, remainder almost black; second scapal segment not very large, flagellar segments elongate-oval, with short verticils. Palpi blackish. *Thorax* rather dark brown, slightly dusted with grey; pleuræ with two large velvet black spots, one on the anepisternite, one on the pleurotegite. *Abdomen* dark brown, ovipostor ochreous. *Legs* rather dark brown. Wings with slight milky tinge, veins all very dark, stigma distinct, dark grey. Cross vein *r* well before tip of *R1*, less than twice its length from fork of *Rs*; *m-cu* at right angles to *Cu*, placed slightly beyond level of fork of *Rs*. Macrotrichia present on *R2* + *3* as well as on other veins in apical part of wing. Halteres yellow.

Length of body, 5.5 mm.: wing, 7 mm.

Kenokok, 1 ♀.

A very distinct species from others known to me by the pleural markings. It is the largest *Orimargula* I have examined.

Orimarga fasciventris sp. n.

Head black, somewhat shining above, with conspicuous silvery grey dusting on the rather narrow frons. Antennæ, rostrum and palpi black. *Thorax* blackish, somewhat shining; sides of præscutum with greyish dusting; pleuræ blacker and more shining than dorsum, but with a broad median longitudinal stripe of grey dusting; hollow above front coxæ deep black. *Abdomen* with segments 1 and 7—9 blackish; 2—6 blackish on the basal half, yellow on the apical half. *Legs* dark brown, coxæ and bases of femora ochreous. *Wings* nearly clear, base of *Rs*, *m-cu* and apical and posterior margins narrowly seamed with brownish; squama and base of cell *An* dark. Macrotrichia very numerous on all branches of *R* and *M*, *Rs* and *R4* + *5* obtusely angled near base; *r* twice its length before tip of *R1*, and a little beyond *r-m; M4* twice as long as *M3 + 4*, the cell *M3* therefore very long; *m-cu* well before middle of *Rs*, which is under twice as long as basal section of *Rs*. Halteres yellow.

Length of body, 6—7.5 mm.; wing, 7 mm.

Kamborangah, 1 ♂ 1 ♀.

A rather distinct species by the conspicuously banded abdomen.

Helius (Helius) amplus sp. n.

♀ *Head* blackish, with brown dusting and black hair. Rostrum blackish above, lighter on sides, slightly longer than head. Antennæ dark brown, second segment rather lighter; about as long as thorax; verticils of moderate length. *Thorax* uniformly reddish-brown, pronotum and upper part of pleuræ indistinctly darker. *Abdomen* dark brown, unbanded. *Legs* uniformly brownish, not very dark, tarsi not paler than tibiæ; on front legs the first tarsal segment about four-fifths as long as the tibia, last four segments together one-third as long as first. *Wings* broad, with faint brownish tinge on membrane; veins not very dark, but with slight and indefinite seams on cord, also on *Cu* and *Ax*; stigma rather dark brown, elongate-oval. *R2 + 3* not quite two-thirds as long as *R4 + 5*, ending well beyond *R1*; cells *M1* and *M2* subequal at base; *m-cu* a little beyond base of discal cell (in some specimens near middle), discal cell rather small. Halteres dark brownish.

Length of body, 9—10 mm. (including ovipostor); wing, 9—11 mm.

Kamborangah, 7 ♀; Pakka, 1 ♂.

Allied to *H. kambangani* (de M.) but larger, differing slightly in venation and in the darkened cord. In *H. kambangani* the stigma fills the tip of cell *R1*, whereas in the new species there is a clear area at the tip of this cell which is about as long as the stigma.

Helius (Helius) bicolor sp. n.

♂ *Head* blackish, somewhat dusted with grey. Rostrum light brownish, slightly longer than remainder of head. Antennæ about as long as thorax; scape brownish, flagellum blackish; dorsal hairs of moderate length. *Thorax* uniformly light ochreous, slightly shining. *Abdomen* with segments 1—4 and 8—9 ochreous, 5—7 blackish. Hypopygium with tergite produced into two widely separated triangular points; inner style long, narrowed and bent inwards on its distal third. *Legs* with coxæ and femora ochreous, tibiæ and tarsi dark brown. First segment of front tarsus about four-fifths as long as tibia and nearly four times as long as remaining four segments together. Hind legs noticeably shorter than middle pair. *Wings* clear, without trace of stigma, veins scarcely darker than membrane, except costa, which is brownish. Fringe rather longer than usual, but not conspicuous. *R2 + 3* about half as long as *R4 + 5; r-m* nearly twice its length beyond fork of *Rs; m-cu* at base of the rather small discal cell. Halteres light brownish.

Length of body, 6 mm.; wing, 8 mm.

Lumu Lumu, 1 ♂.

Allied to *H. unicolor* Brun., differing in the bicolored abdomen and other respects.

Helius (Helius) dolichorhynchus sp. n.

Head black, somewhat dusted with grey. Rostrum black, slender, almost twice as long as thorax, rather shorter in ♀. Antennæ blackish, second segment lighter; in ♂ subequal in length to rostrum, in ♀ not longer than thorax; verticils of moderate length. *Thorax* reddish-brown, somewhat shining; scutal lobes, scutellum and postnotum darkened. *Abdomen* blackish above, pale beneath. Hypopygium with the tergite somewhat produced in middle, with a small tuft of short black hair; tip of coxite slightly produced and with 3—5 very long, pale, bristly hairs; a tuft of pale hair also near base of coxite within, and some bristly pale hairs at the base of the narrow distal third of the inner style. *Legs* brownish, only coxæ and bases of femur paler; middle and hind legs equal in length; first segment of front tarsus scarcely two-thirds as long as tibia and only about twice as long as remaining four segments together. *Wings* clear, all veins dark but not seamed; stigma elongate, greyish, leaving tip of cell *R1* broadly clear. *R2 + 3* two-thirds as long as *R4 + 5; r-m* about its own length beyond base of *R4 + 5; m-cu* at base of discal cell; cells *M1* and *Ms* subequal at base. Halteres light brownish.

Length of body, 6—7 mm.; wing, 7.5 mm.; rostrum 3—3.5 mm.

Lumu Lumu, 1 ♂ 1 ♀.

This differs from other Oriental species known to me in the unusual length of the proboscis.

Helius (subgen. n. ?) **patens** sp. n.

Head pale yellowish; antennæ, rostrum and palpi black. Front rather wider than in most species of the genus, but eyes subcontiguous below. Antennæ alike in the two sexes, slender, about as long as thorax. Rostrum very slender, but only a little longer than head, bare above, shortly hairy beneath. Palpi unusually short, and composed of only one or two segments (two distinct segments in ♂, apparently only one in ♀). *Thorax* dull yellowish, præscutum with a brownish median stripe, not very conspicuous. *Abdomen* yellow, with blackish bands on posterior margins of segments 2—6, rather broader in ♀ than in ♂. *Legs* (only one remaining) uniformly pale brownish. *Wings* clear, all veins pale, including costa. *Rs* short, somewhat angulate near base, not much more than half as long as *R2* + *3*, which is well over half as long as *R4* + *5*; tips of *R1* and *R2* + *3* ending rather close together in costa in ♀, but both abbreviated in ♂ (perhaps not normally); *r-m* long, placed only a little beyond fork of *Rs*; discal cell confluent with cell *M1*; cell *M3* about as long as its stem; *m-cu* fully its own length beyond first fork of *M* and scarcely its own length from wing-margin. Halteres yellow.

Length of body, 3.5—5.5 mm.; wing, 4.5—5.5 mm.

Kamborangah, 1 ♂; Lumu Lumu, 1 ♀.

Although with a superficial resemblance to *H.* (*Eurhamphidia*) *pallens*, this is very distinct by the slender rostrum, reduced palpi, and quite different venation. The characters are probably sufficient to warrant the erection of a new subgenus.

Helius (Eurhamphidia) pallens sp. n.

♂ Allied to *H.* (*E.*) *mirus* Edw. (Sarawak), which it resembles in its pale yellowish body and pale grey wing-markings, including the tip, a rather broad band over the cord, and an area along the basal half of *Cu* (this last point not mentioned in the original description), but differs as follows:—Antennæ black, except for the first segment, which is yellow. Palpi black. *Thorax* with indications of a darker median area on front of præscutum. Femora rather darker. *Abdomen* with black basal bands on segments 2—6; segment 8 and tergite 9 black. *Wings* with *r-m* well preserved; cell *M1* broad at base.

Length of body, 4 mm.; wing, 5 mm.

Lumu Lumu, 2 ♂.

Helius (Eurhamphidia) mimicans sp. n.

Head brownish; rostrum, palpi and antennæ blackish. Rostrum about equal in length to remainder of head. Antennæ in ♂ quite half as long as body, flagellar segments nearly cylindrical, about four times as long as broad, with rather long erect pubescence; in ♀ scarcely longer than thorax, with shorter pubescence. *Thorax* uniformly dull brownish. *Abdomen* blackish, genitalia ochreous. Ninth tergite in ♂ somewhat produced, slightly bilobed in middle. *Legs* with coxæ ochreous; femora, tibiæ and basal third of tarsi blackish, remainder of tarsi white. *Wings* clear, with brownish stigma; all veins dark; venation normal for the subgenus, *r-m* a little beyond middle of *Rs*. Halteres with ochreous stem and brown knob.

Length of body, 4—5 mm.; wing, 5—6 mm.

Kamborangah, 6 ♂, 2 ♀; Lumu Lumu, 2 ♂, 4 ♀.

The colouring of this species is very suggestive of a species of *Thrypticomyia*, especially as regards the dark knees and white-tipped tarsi; hence the specific name. In *H.* (*E.*) *niveitarsis* Skuse (Australia) as well as in some allied Oriental forms, the knees, tips of tibiæ, and the whole tarsi are white. The specimen previously recorded by me from Mt. Dulit is *H. mimicans* and not *H. niveitarsis.*

Ceratocheilus majus Edw.

Kamborangah, 1 ♀

Ceratocheilus latifrons Brun.

Kamborangah, 1 ♀; Lumu Lumu, 1 ♂; Tenompok Pass, 1 ♂.

The specimens are considerably larger and darker than those I recently reported from North Borneo.

Ceratocheilus contractifrons sp. n.

Head light grey (owing to heavy dusting on a dark ground), darker on occiput. No corniculus. Front in ♂ at its narrowest point (which is much above base of antennæ) about as wide as 4—5 facets, in ♀ broader (8 facets). Antennæ 12-segmented, the small first segment ochreous, remainder black; second segment less swollen than in *C. latifrons*, third longer and narrower than second, following segments distinctly longer than broad even in ♂, and longer in ♀ than in ♂. *Thorax* only moderately produced in front; ground colour dark; præscutum with three subconfluent dark brown stripes on a greyish ground; scutum and scutellum dark brownish; pleuræ somewhat lighter below, but not striped. *Abdomen* blackish, not distinctly banded, though the tergites are lighter at the posterior lateral corners. Hypopygium rather large, ochreous; in structure remarkable for the form of the two penis-filaments, which are stout, longer than the hypopygium itself, and bent into an S-shaped curve; tergite somewhat prominent in middle; style rather slender, mainly pale, but with a long black tooth in middle at right angles to the main axis. *Legs* blackish. *Wings* slightly smoky, veins all dark, no stigma or other markings. *R2 + 3* short, with a rather strong double curve; discal cell closed in ♀, open on one wing in ♂, *m-cu* at its base. Halteres yellowish.

Length of body, 5—8 mm.; wing, 6—7 mm.; rostrum, 4—5 mm.

Kamborangah, 1 ♂, 1 ♀; Lumu Lumu, 1 ♀.

Allied to *C. latifrons*, Brun. differing in the narrower frons, pale first antennal segment, rather longer antennæ, and structure of hypopygium. *C. formosensis* Alex. (Formosa) has a hypopygium of somewhat similar type, but quite different in detail. In describing *C. formosensis* Alexander refers to the filiform structures as gonapophyses; they are however tubular organs with an opening at the tip, and undoubtedly are to be regarded as a double penis.

Elephantomyia (Elephantomyodes) argenteocincta Walk.

Kenokok, 1 ♀.

Elephantomyia (Elephantomyodes) nigriclava sp. n.

♀ *Head* black above, with a narrow median grey line; pale yellowish beneath and round ocelli. Eyes separated by at least the width of five facets. Antennæ and rostrum black; verticils of distal flagellar segments about twice as long as the segments. *Thorax* dull brownish-orange, pleuræ lighter posteriorly. *Abdomen* mainly velvet-black; all tergites with posterior margins narrowly yellow; broader basal dull yellow bands on each of segments 2—6. Ovipostor dark. *Legs* mainly black; coxæ brownish-orange; tarsi with tips of first and whole of second and third segments pure white; on posterior legs the white tip of the first segment is very narrow, on front legs broader (one-fifth the length of the segment). *Wings* nearly clear, all veins black; stigma blackish, filling the space between *R1* and *R2 + 3*, cell *Sc* also dark; *Rs* and *R2 + 3* rather gently curved at base, not angulate as in most allied species; distance between tips of *Cu* and *An* about equal to *m-cu; Ax* nearly in contact with hind margin basally. Halteres black.

Length of body, 9 mm.; wing, 9 mm.; rostrum, 6.5 mm.

Lumu Lumu, 1 ♀.

Closely allied to *E. nigriceps* Edw. (Sarawak and Malaya), differing in the more widely separated eyes, shorter rostrum, shorter antennal verticils, and less white on tarsi. In these points it resembles *E. major* Alex. (Formosa), of which it may be a variety, but seems to differ from both *E. major* and *E. nigriceps* in the black halteres and curved instead of angulate base of *R2 + 3*.

Styringomyia flava Brun.

Lumu Lumu, 1 ♀; Kamborangah, 1 ♀.

Atarba limbata sp. n.

Head yellowish, somewhat shining. Antennæ brownish-yellow, darker apically; flagellar segments oval, first not longer than second, about twice as long as broad. Palpi yellow, the long terminal segment black. *Thorax* largely yellow, mesonotum shining; lateral (but not anterior) margins of præscutum black; pleuræ blackish above, especially posteriorly, pleurotergites wholly black; immediately below the black area of pleuræ is a conspicuous patch of fine silvery pubescence. *Abdomen* yellow; first tergite dark; broad dark brown bands on posterior margins of tergites 2—5 (none on 6). *Legs* entirely yellow, femora not darkened apically. *Wings* yellowish, unmarked, veins all yellowish. Halteres yellow.

Length of body, 7 mm.; wing, 7 mm.

Kamborangah, 3 ♀; Lumu Lumu, 3 ♀.

Most nearly allied to *A. marginata* Edw. (Malaya), differing in the more extensively black pleuræ and absence of black on femora.

Molophilus albiceps Edw.

Kamborangah, 6 ♂, 4 ♀; Lumu Lumu, 2 ♀; Kenokok, 1 ♀.

Molophilus kinabaluanus sp. n. (Fig. 11.)

Almost completely pale yellowish-brown; only tarsi, palpi and antennal flagellum dark brown. Antennæ alike in the two sexes, shorter than thorax; all flagellar segments shortly oval, with verticils of moderate length and without distinct pubescence. *Thorax* dull, but without pruinescence.

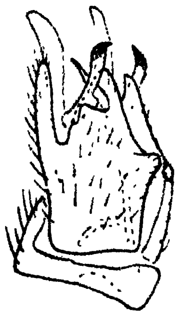

Fig. 11. *Molophilus kinabaluanus* sp. n. ♂ hypopygium.

Hypopygium (text fig. 11) with both styles simple, somewhat sword-shaped, one dark and the other pale; tergal process of coxite long, arising near middle; penis long. *Wings* yellowish, with pale hair and veins; rather numerous macrotrichia scattered over the whole wing-membrane; in the distal cells these are in rather irregular single rows, in the basal cells rather more numerous. Venation: *r* its own length beyond fork of *Rs;* stem of cell *R3* rather long, fully twice as long as *r; Ax* ending below or immediately before *m-cu.*

Length of body, 2.5—3 mm.; wing, 3.5—4 mm.

Kamborangah, 20 ♂.

Except for the presence of macrotrichia on the wing-membrane, this is a typical *Molophilus;* it does not belong to the genus or subgenus *Dasymolophilus,* which if retained must be based on other characters than the hairy wings.

Molophilus griseatus sp. n.

♂ *Head* brownish, lighter above antennæ, with rather heavy and uniform grey pruinescence. Antennæ about as long as thorax; first five or six segments yellow, remainder dark brown; flagellar segments oval, first few rather swollen, all with dense pubescence which is fully as long as their diameter and with moderately long verticils. Palpi and the very short rostrum black. *Thorax* brown, prothorax and scutellum more yellowish; whole surface rather heavily dusted with pale grey; hairs black. *Abdomen* blackish, except for the ochreous hypopygium. Styles both black, bent at right angles in middle and pointed, with the points directed in opposite directions (dorsally and ventrally); one style much longer than the other, and comparatively less stout; tergal process of coxite short, subterminal. *Legs* dark brown, coxæ rather lighter. *Wings* unmarked; base obscurely yellowish; hair uniformly dark. Cross-vein *r* situated rather more than its own length beyond fork *Rs* and immediately above base of cell *R3; Ax* reaching distinctly beyond *m-cu.* Halteres blackish.

Length of body, 2.5—3 mm.; wing, 4 mm.

Kamborangah, 1 ♂.

Related to *M. malayensis* Edw., differing in the uniformly dark costal hair and form of the styles.

Erioptera (Ilisia) fenestrata de Meij.

Marei Parei, 2 ♂.

Erioptera nigribasis Edw.

Lumu Lumu, 1 ♀.

Erioptera (s. str.) **cacuminis** Edw.

Kamborangah, 30 ♂, 17 ♀; Pakka, 35 ♂, 19 ♀; Lumu Lumu, 1 ♂, 3 ♀; Marei Parei, 4 ♂, 1 ♀; Tenompok Pass, 1 ♀.

Erioptera (s. str.) **notata** de Meij.

Kiau, 1 ♀.

Erioptera (s. str.) **javanensis** de Meij.

Kiau, 3 ♀.

Erioptera (Teleneura) parallela Brun.

Kamborangah, 1 ♂.

In this specimen the hypopygium is almost as in *E. fusca* de Meij. and *E. subfusca* Edw., but the species may be distinct owing to the much lighter colour of the head and thorax. A feature (not heretofore noted) which is common to all the species of this group (including *E. argentifrons* Edw.) is that the legs are covered with small but rather broad close-lying scales. This is not the case with *E. nigribasis* Edw., which Alexander also includes in the subgenus *Teleneura.*

Erioptera ? fusca de Meij.

Marei Parei, 1 ♀.

Empeda gracilis de Meij.

Kiau, 1 ♂.

Empeda poiensis Edw.

Kamborangah, 7 ♂, 3 ♀; Lumu Lumu, 1 ♀; Tenompok, 1 ♀.

Empeda suffumata sp. n.

Head blackish, but the colour obscured by heavy grey dust. Palpi and antennæ blackish, the latter short, with short verticils; first few flagellar segments shortly oval, remainder slender. *Thorax* blackish brown, with rather heavy and uniform grey dusting. Anterior pits exactly in line with the foveal, as usual in this genus. *Abdomen* blackish-brown, scarcely dusted, with whitish hair. Hypopygium with outer style wholly blackened, forked near base, outer branch long, curved, pointed, inner branch about two-thirds as long as outer, slightly trifid at tip; inner style bare and pale; tergite very small; parameres not obvious. *Legs* brownish; femora gradually darkened towards tip; no scales. *Wings* with a rather strong and nearly uniform brownish suffusion; stigma dark brown; a dark brown cloud over base of *R4* + *5* and *r-m*. Cross-vein well before middle of stigma. Venation normal, much as in the European *E. nubila* Schum. Halteres yellowish.

Length of body, 3—4.5 mm.; wing, 4.5—6.5 mm.

Pakka, 62 ♂, 30 ♀; Kamborangah, 1 ♂.

Differs from allied species (such as *E. poiensis* Edw.) in its larger size and in the clouded cross-vein *r-m*.

As in all other species of *Empeda* I have examined, the pleuræ are completely bare; this seems to afford a good distinction from *Erioptera* s. str., all the species of which, so far as I am aware, have a patch of long erect hair on the ptero-pleura.

Cryptolabis (Baeoura) pubera sp. n.

♀ *Head* brownish, heavily dusted with pale grey. Antennæ dark brown, flagellar segments all elongate-oval to subcylindrical, first four or five with long pubescence (nearly twice as long as the diameter) and each with one or two long dorsal hairs, remainder without pubescence but with long verticils. Palpi and proboscis yellowish. *Thorax* rather light brown, dusted with grey, more heavily so on pleuræ; mesonotum with long dark hair. *Abdomen* brownish, tergites darker posteriorly. *Legs* (hind leg only remaining) uniformly ochreous, clothed with long and rather dense erect hair. *Wings* only slightly tinted with grey, quite unmarked, with long macrotrichia on all veins. Venation normal. Halteres brownish-ochreous.

Length of body, 5 mm.; wing, 7 mm.

Lumu Lumu, 1 ♀.

This resembles *C. pilipes* Edw. (Java) and *C. trichopoda* Alex. (Formosa) in the very hairy legs, differing from both in the unmarked wings.

Gonomyia (s. str.) **hamulata** sp. n. (Fig. 12.)

Head mainly blackish, but rostrum orange-yellow; antennæ and palpi wholly black. Antennæ alike in the two sexes; first three or four flagellar segments somewhat swollen, rest very slender, with short verticils. *Thorax* almost entirely dull, only scutellum slightly shining; pronotum yellow as usual; mesonotum dark brownish-grey, scutellum lighter; pleuræ mostly brownish-ochreous, but anepisternite and lower part of sterno-pleura dark. *Abdomen* wholly dark brown. Hypopygium (text fig. 12) : inner style with one very strong black hook, outer style finger-like, without blackened area; ædeagus with a reflexed black hook which is variable in development. *Legs* dark brown, even the coxæ darkened, especially front pair. *Wings* clear, with faint brownish stigma and sometimes a very faint seam over the cord. Venation as in *G. bryanti* Alex. Halteres mainly dark.

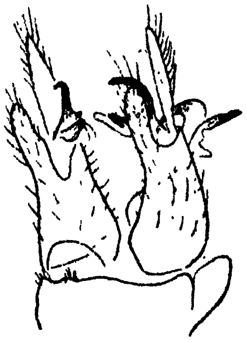

Fig. 12. Gonomyia (G.) hamulata sp. n. ♂ hypopygium.

Length of body, 4—5 mm.; wing, 5—6.5 mm.

Kamborangah, 1 ♂, 1 ♀; Pakka, 1 ♂, 7 ♀.

In the male from Pakka the hook on the ædeagus is very much smaller than in the type from Kamborangah, but all the other structures are the same. The species is closely allied to *G. bryanti* Alex., differing in the yellow rostrum and the much longer black hook on the inner style.

Gonomyia (Progonomyia) brunnescens Edw.

Lumu Lumu, 1 ♂; Kamborangah, 1 ♂.

Gonomyia (Lipophleps) conjugens White.

Kiau, 1 ♀.

Gonomyia (Lipophleps) robinsoni Edw.

Kiau, 1 ♀.

Gonomyia (Lipophleps) bicolorata Alex., 1930 (*citrocostalis* Edw. 1931).

Kiau, 2 ♀. Alexander's type was a male from Luzon, but his description of the colouring agrees so closely with the type female of *citrocostalis* that there can be little doubt the species are the same.

Rhabdomastix flavidula Edw.

Kabayau, 1 ♀.

Gnophomyia nitens sp. n.

♂ *Head* blackish, dusted all over with dark grey. Antennæ wholly black, twice as long as head and thorax together; first flagellar segment six times as long as broad, following segments each a little shorter; terminal segment much shorter than penultimate and barely twice as long as broad; as is usually the case in this subfamily when the antennæ are lengthened, the pubescence is dense and longer than the diameter of the segments, but the verticil hairs are absent or scarcely distinguishable from the pubescence. Palpi dark brown. *Thorax* wholly black; præscutum and scutum brilliantly shining; scutellum and most of pleuræ rather heavily dusted with grey; anepisternite and pleurotergite appearing dull black from above, slightly shining black when viewed from beneath. *Abdomen* missing. *Legs* rather dark brownish, all coxæ ochreous. *Wings* somewhat smoky; veins moderately dark; no trace of stigma. Macrotrichia of all veins rather long and conspicuous. *R1* long, its terminal section more than half as long as *R2*, and about six times as long as *r*; tip of *R2* not at all upturned; veinlets closing discal cell in transverse alignment; *m-cu* only a little before middle of discal cell; *M4* and *An* equidistant from *Cu* on wing margin. Halteres with stem mainly dark, knob wholly pale yellow.

Length of wing, 7 mm.; antenna, 5 mm.

Kamborangah, 1 ♂.

The combination of shining thorax, long antennæ, yellow halteres and long vein *R1* distinguishes this species from all others of the genus known to me. *G. filiformis* Alex. and *G. macrocera* Alex. (Philippine Is.) also have long antennæ in the male sex, but different thoracic colouring.

Gnophomyia flaviclava sp. n. (Fig. 13.)

Head black, somewhat shining, with slight grey dusting, most noticeable above antennæ. Antennæ entirely black, in both sexes somewhat longer than head and thorax together; flagellar segments fusiform, about three times as long as broad, with short pubescence; verticils about as long as segments. Palpi black. *Thorax* wholly black, with heavy pale grey dust on scutellum and much of pleuræ; mesonotum somewhat shining; a single large dull black spot on anepisternite; pleurotergite black but slightly shining. *Abdomen* black; hypopygium as figured (text fig. 13); cerci of ♀ quite short, under three times as long as their depth at the base. *Legs* black, including all coxæ, which however are heavily grey-dusted. *Wings* somewhat smoky, with dark veins and blackish stigma. Macrotrichia of veins short and inconspicuous. *R1* ending at outer end of stigma, its tip under three times as long as *r*; *m-cu* close to the base of the rather short discal cell. Halteres black, outer half of knob yellow.

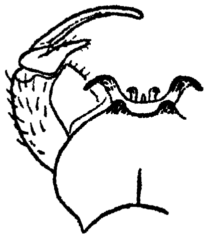

Fig. 13. Gnophomyia flaviclava sp. n. ♂ hypopygium.

Length of body, 4—5 mm.; wing, 4—5 mm.

Kenokok, 1 ♂, 1 ♀.

Distinguished from its rather numerous allies by the structure of the hypopygium. The colour of the halteres is also rather distinctive, several nearly related forms having these organs wholly black.

Trentepohlia (Mongoma) cariniceps End.

Kenokok 1 ♀.

Trentepohlia (Mongoma) fortis Edw.

Kenokok 1 ♀.

Trentepohlia (Mongoma) pennipes O.-S.

Kiau, 1 ♂, 2 ♀; Kabayau 1 ♂, 1 ♀.

Trentepohlia (Mongoma) ? hendersoni Edw.

Marei Parei, 1 ♂,; Lumu Lumu, 1 ♀.

Trentepohlia (Mongoma) spiculata sp. n.

A large species of the *cariniceps* group, most nearly allied to *T. lutescens* Edw. (North Borneo), with which it agrees in its uniformly orange-brown thorax, stout and uniformly brown legs, with 10—20 short black spines at the base of each femur beneath, but differs as follows:—Head largely black, brownish only towards the nape. Antennal segments (except the first few) each with two long dorsal hairs, of which the proximal one is a little longer than the segment, the distal one nearly twice as long as the segment, but shorter than the single hair of *T. lutescens*. Palpi and labium yellowish. Thorax with the mesonotum wholly dull, only the pleuræ lightly shining. Lobes of mesosternum each with a group of black bristly hairs (in *T. lutescens* the mesosternum is either quite bare, or has a few inconspicuous pale hairs). Abdomen almost entirely dark brown. Wings with the stigma less conspicuous; all veins dark brown except costa, which is rather paler.

Length of body, 11—14 mm.; wing, 11—12 mm.

Kenokok, 1 ♂, 3 ♀.

This is very similar in appearance to *T. cariniceps* End. and *T. fortis* Edw., both of which were also found in the same place. *T. cariniceps* differs in having no femoral spines; *T. fortis* in having only a few such spines, the mesonotum as well as the pleuræ somewhat shining, and many of the wing-veins pale.

Trentepohlia (Mongoma) fimbriata sp. n.

♂ *Head* black, including the short neck; antennæ and palpi also blackish, but labium yellowish. Flagellar segments oval, barely twice as long as broad, without long hairs. *Thorax* uniformly dark brown, mesonotum dull, pleuræ somewhat shining. Mesosternal and supra-alar hairs strong, bristly, black. Præscutum moderately produced over pronotum. *Abdomen* uniformly dark brown. *Legs* (only one middle leg remaining) uniformly dark brown, of moderate length; no femoral spines. *Wings* greyish; stigma faintly darker; all veins dark. Costal fringe long, in region of stigma fully as long as width of costal cell. Tip of *R1* rather strongly curved up to costa; *r* oblique, longer than first section of *R2 + 3; R3* rather sinuous; discal cell rather broad, the three middle veinlets closing it subequal in length. Halteres dark.

Length of body, 5 mm.; wing, 6 mm.

Kenokok, 1 ♂.

The unusual length of the costal fringe distinguishes this from allied species.

Trentepohlia (Mongoma) kinabaluensis sp. n.

Head black, including neck. Antennæ with scape dark brown, first few flagellar segments light brownish, remainder darker; no long dorsal hairs. Palpi and labium black. *Thorax* with mesonotum dull ochreous; præscutum with an ill-defined median brown stripe which broadens posteriorly; scutum with two large dark brown areas, scutellum also dark; pleuræ distinctly shining, broadly dark brown above from neck to base of abdomen, lower part of sternopleura also dark. Præscutum considerably produced over pronotum (more so than in the *cariniceps* group). A row of four black bristles above each wing-root; 4—6 black bristly hairs on each lobe of mesosternum. *Abdomen* brown, much darker on lateral margins. *Legs* uniformly brown except for the ochreous coxæ; tips of femora indistinctly lighter; no femoral spines. *Wings* faintly greyish, costal cell more yellowish, all veins dark; stigma large, dark brown; rather broad brown seams over all the transverse veins and at base of *Rs*, also a dark brown cloud round tip of wing, especially towards costa. Venation much as in *T. pennipes* O.—S. Halteres yellow.

Length of body, 8 mm.; wing, 8 mm.

Kamborangah, 1 ♂, 1 ♀; Marei Parei, 2 ♂; Lumu Lumu, 1 ♂, 1 ♀.

Allied to *T.* (*M*) *sarawakensis* Edw., which differs chiefly in the uniformly brownish-ochreous thorax and absence of any dark cloud at the tip of the wing.

Trentepohlia (Trentepohlia) bifasciata Edw.

Kiau, 1 ♂, 3 ♀.

Trentepohlia (Trentepohlia) mcgregori Alex. (*nigrogeniculata* Edw.)

Kabayau, 7 ♂, 3 ♀.

Conosia irrorata Wied.

Kenokok, 1 ♀.

Epiphragma insignis v. d. W.

Lumu Lumu, 1 ♂, 1 ♀.

Epiphragma vicina Brun.

Kamborangah, 2 ♂; Lumu Lumu, 2 ♂, 2 ♀.

Limnophila (Dicranophragma) fenestrata Edw.

Kenokok, 1 ♀.

Limnophila (Dicranophragma) maculithorax Edw.

Kiau, 1 ♀.

Limnophila (Ephelia) dulitensis Edw.

Kamborangah, 1 ♂.

This was described from the female only. In the present male the wings are not broadened, and the outer style is rather narrow, ending in a single small point.

Limnophila (Ephelia) concreta sp. n. (Pl. XII, fig. 13).

♂ Closely allied to *E. granulata* Edw. (Sarawak and Malaya), and like that species having the outer style ending in two large curved points, one sharper than the other, but differs as follows:—Præscutum, in addition to rows of tiny dark dots along the interspaces, with a pair of larger dark marks close together at some distance in front of suture, and with a nearly transverse dark streak a little behind each fovea. Outer style with only one large denticle on outer margin. Femora with the whole tip blackened. *Wings* (pl. xii, fig. 13) not quite so broad (though distinctly widened in middle); all the larger dark marks solidly brown; cross-vein in basal cell situate well beyond instead of in a line with the first large spots on costa and hind margin; apex of discal cell scarcely darkened, and spot over cell *M1* quite small; cell *M1* differing in shape, *M1* continuing the direction of *M1—2* and *M2* strongly curved at base. Knobs of halteres largely blackish except at base.

Length of body, 5 mm.; wing, 6.5 mm.

Marei Parei, 1 ♂.

This is also closely allied to *L.* (*E.*) *igorota* (Luzon), differing in thoracic markings and in the black-tipped femora.

Limnophila (Pœcilostola) pendleburyi Edw.

Marei Parei, 1 ♂.

Limnophila (Pœcilostola) guttularis Edw. (Pl. XII, fig. 11).

Kamborangah, 2 ♂; Lumu Lumu, 4 ♂.

In these specimens the wing-spots (pl. xii, fig. 11) are rather larger and more confluent than in the type from Sarawak.

Limnophila (Pœcilostola) pakkana sp. n. (Pl. XII, fig. 12).

♂. Allied to *L.* (*P.*) *guttularis* Edw., having very similar colouring of body and legs, markings of wings and structure of hypopygium, differing as follows:—Antennæ much longer, fully twice as long as thorax; flagellar segments sub-cylindrical, sub-equal in length, quite four times as long as broad, without verticils but with the fine pubescence longer than usual, almost twice as long as diameter of segments. *Wings* (pl. xii, fig. 12) with the spots rather smaller and fainter than in the type of *L. guttularis* (hence much less developed than in the variety of *L. guttularis* recorded above), the last two costal spots, especially, being less conspicuous.

Length of body, 5 mm.; wing, 6.5 mm.

Pakka, 3 ♂; Kamborangah, 1 ♂.

Pilaria (Eupilaria) albicans sp. n.

♂. *Head* blackish. Front fully as broad as one eye. Antennæ quite short, 16-segmented as usual, dark brown except for the first few flagellar segments, which are lighter; segments 4—7 very little longer than broad, 8—16 longer, with longer (but still short) verticils. *Thorax* black, with rather heavy whitish dust over most of the surface; a broad median stripe on præscutum less heavily dusted, but as seen from in front this stripe appears bordered by a silvery-white line; on posterior half of præscutum, behind each of the large, round humeral pits, is a longitudinal shining black area; scutum with a pair of round shining black spots; scutellum and postnotum more heavily white-dusted. Pleuræ wholly black, with a large silvery-pollinose area on sternopleura. *Abdomen* with heavy whitish dusting on first segment, remainder brown, without dusting. Hypopygium with outer style of rather peculiar form, broadened subapically and ending in a small hook which is not at all darkened, tergite with a pair of thumb-like projections; two pairs of parameres, one straight and rod-like, the other semi-tubular, rather widened at tip, with an out-turned point. *Legs* with coxæ yellowish; femora light brownish with tips rather broadly black; tibiæ and tarsi dark, on hind legs segments 2 and 3 (perhaps also 4 and 5) whitish; tibial spurs minute. *Wings* nearly clear, with brown veins and stigma. Venation as in *L. opaca* de Meij., with *R2* very short and turned up at tip, and cell *M1* absent. Halteres dark.

Length of body, 5 mm.; wing, 6 mm.

Marei Parei, 1 ♂.

This is evidently nearly related to *Limnophila opaca* de Meij., differing in the thoracic ornamentation, which is very distinctive. *Pilaria phaenosoma* Alex. and *P. leucopoda* Alex. (Philippine Is.) also have a similar venation and hypopygium, but very different colouring of the thorax. Whether these species are correctly referred to *Pilaria* appears doubtful.

Limnophila (sens. lat.) **ecalcarata** sp. n.

Head blackish, with light brownish dusting, paler on face and above antennæ; front produced into an obtuse cone, scarcely half as wide as one eye. Antennæ black, not longer than thorax, flagellar segments shortly oval, with short verticils. Palpi black. *Thorax* dull, dark reddish-brown above, paler on pronotal lobes and on pleuræ; an ill-defined blackish stripe on each side from neck to base of abdomen. *Abdomen* blackish above, lighter beneath. Hypopygium with the tergite simple, slightly emarginate in middle; outer style ending in a single blackened, curved point; inner style rather slender; parameres in the form of short, stout, rather blunt hooks; penis quite short. *Legs* very slender, blackish, with coxæ and trochanters ochreous. No trace of tibial spurs. *Wings* uniformly blackish-grey, stigma hardly darker than ground-colour; in shape rather long and narrow, with the pre-arcular area rather longer than usual in this group. All veins with rather conspicuous macrotrichia, but membrane bare. Arcular cross-vein absent. *Sc* ending well beyond end of *Rs*, *Sc2* at its tip; *r* quite three times its own length before tip of *R1*; *Rs* long, more or less angled at base; *R2 + 3* not much longer than first section of *R2;* cell *M1* as long as its stem or longer; *m-cu* just before middle of discal cell. Axillary area small, with slight anal angle. Halteres long and slender, blackish.

Length of body, 5.5—6 mm.; wing, 8—9.5 mm.

Kamborangah, 1 ♂ : Lumu Lumu, 1 ♂ 1 ♀.

I know of no close ally of this species in the Oriental fauna, and its position in the genus *Limnophila* is open to question, on account of the absence of tibial spurs and of the arcular cross-vein, characters which are exhibited by the New Zealand group *Heterolimnophila* Alex. The new species may be allied to the European *L. ochracea* Mg., which has a similar hypopygium.

Eriocera sp. cf. **morosa** O.-S.

Kenokok, 1 ♀.

Ula bifilata sp. n.

♂. *Head* dull blackish, without obvious grey dusting (but possibly discoloured); rostrum heavily dusted with grey above, almost bare, with two long hairs at tip. Antennæ and palpi blackish; flagellar segments elongate oval, sub-equal in length, the longest under 3 x 1, each with dense pubescence as long as its diameter and with one long dorsal hair as long as the segment. *Thorax* blackish; mesonotum scarcely shining, but without obvious pruinescence and without trace of stripes; pleuræ with heavy grey dusting on lower half, most obvious as seen from above. *Abdomen* blackish; hypopygium ochreous and rather large, normal in structure except that the penis is produced into two long slender, curved threads which if straightened out would be twice as long as the coxite. *Legs* with coxæ ochreous, appearing dusted with whitish-grey when viewed from above, middle pair darkened in front; remainder of legs dark brown, femora somewhat paler basally. *Wings* with a rather strong and uniform smoky tinge, scarcely paler basally. Venation much as in the genotype.

Length of body, 5 mm.; wing, 7 mm.

Lumu Lumu, 1 ♂.

Resembles *U. javanica* Alex. more closely than any other Oriental species, but appears to differ from the description in some points, *e.g.* the black head and grey rostrum. The penis-filaments are not mentioned by Alexander; in *U. bifilata* they are so conspicuous that they could hardly be overlooked.

Nipponomyia novempunctata S.-W., var. ?

Lumu Lumu, 1 ♀. Differs from the type in having no dark seam over *r-m.*

Nipponomyia flavicollis sp. n. (Pl. XII, fig. 14).

Head yellowish, with slight whitish dusting, especially round eyes. Antennæ and palpi yellowish. *Thorax* light yellowish, with thin whitish dusting on pleuræ and sides of mesonotum. Præscutum unmarked; scutal lobes mainly dark brown or blackish; postnotum also darkened to a variable extent, in the type ♂ almost all black. *Abdomen* light yellowish, with more or less obvious traces of transverse dark bands basally on segments 3—6, most obvious in ♂. Hypopygium similar to other species of the genus; parameres broad, with a very short apical point; inner style with only two strong black spines which are well separated and set at right angles to one another. *Legs* pale yellowish; tips of femora and tibiæ narrowly blackened, more obviously so in some specimens than in others. *Wings* (pl. xii, fig. 14) with a faint yellowish tinge, veins yellow; stigma and costal cell slightly deeper yellow; about ten small dark grey spots as in figure. Halteres yellow.

Length of body, 12—14 mm.; wing, 12—14 mm.

Pakka, 1 ♂, 3 ♀; Kamborangah, 5 ♀.

Allied to *N. sumatrana* de Meij., differing in colouring of thorax and wings.

Subfamily CYLINDROTOMINAE.

Stibadocera fasciata Edw.

Lumu Lumu, 1 ♂; Kamborangah, 2 ♂

This was described as a variety of *S. metallica* Alex., but is more probably a distinct species.

Subfamily TIPULINAE.

Dolichopeza cuneata Edw.

Kenokok, 9 ♂, 7 ♀.

Dolichopeza pallidithorax de Meij.

Lumu Lumu, 2 ♂, 1 ♀.

Dolichopeza ? **capnora** Alex.

Lumu Lumu, 1 ♀.

Dolichopeza infumata sp. n.

♂. *Head* brownish-ochreous, rostrum and palpi blackish. Antennæ about as long as thorax, short-haired, scape brownish-ochreous, flagellum blackish; first flagellar segment twice as long as second, last (eleventh) flagellar segment quite short. *Thorax* dull brownish ochreous above, darker on pleuræ and posteriorly; rows of short dark dorsocentral hairs present; dark hairs also above wing-roots and on postnotum. *Abdomen* black, including most of hypopygium. Ninth tergite only slightly produced at corners, median area not strongly differentiated, without blackening or marginal teeth, only a small blackened area towards each side; dorsal style broadly finger-like, truncate at tip, dark. *Legs* blackish-brown; trochanters paler; distal half of all tarsi dull whitish. Apparently only one spur on each tibia. *Wings* uniformly dark grey, unmarked, even the stigma scarcely darker than ground-colour. No macrotrichia on membrane, those on veins very short and inconspicuous. *Rs* long, quite half as long again as *m-cu*, slightly curved at base, then straight; *M1* about half as long again as either of the two preceding sections of *M1—2;* cell *M4* much narrowed apically, broad basally; axillary area fairly broad, with distinct anal angle. Halteres with dark brown knob, stem paler.

Length of body, 11 mm.; wing, 15 mm.

Kamborangah, 1 ♂.

This is allied to the Indian *D. obscura* Brun., but is larger, with rather longer *Rs* and simpler ninth tergite. The tarsi in the Indian species also have the distal half whitish, a fact not mentioned by Brunetti.

Dolichopeza (Nesopeza) gracilis de Meij.

Lumu Lumu, 1 ♀.

This specimen agrees rather closely with de Meijere's description and figure of the type from Java. The markings of the abdomen are characteristic; tergites 2—6 each have a whitish triangle before the middle on each side, the base of the triangle being on the lateral margin of the tergite, also a yellowish spot beyond the middle dorsally. The meron is not conspicuously dark.

Dolichopeza (Nesopeza) major Edw. (Pl. XII, fig. 19).

Kamborangah, 2 ♂, 3 ♀; Lumu Lumu, 2 ♂.

This was described as a variety of *D. gracilis*, but is certainly a distinct species. Apart from the differences mentioned in the original description of the types (from Mt. Murud), there is a striking difference in the ornamentation of the thorax. In *D. gracilis* the præscutum has three dark brown stripes, the median one with a blackish central line, and the scutum two dark brown areas; the prothorax is almost wholly black and the pleural markings inconspicuous. In *D. major* the mesonotum is uniformly light brown and the prothorax largely pale, but the pleuræ have more distinct markings. The abdominal markings are rather obscure, but quite different from *D. gracilis*; tergites 2—6 are mainly brownish, with indications of darker transverse bands in middle and apically.

Dolichopeza (Nesopeza) borneensis Edw.

Lumu Lumu, 8 ♂, 4 ♀.

Described as a variety of the Indian *D. costalis* Brun., this is also almost certainly a distinct species. The male hypopygium is remarkable for having the sternite elongate, appearing as a conspicuous point to the naked eye; tergite with a small median black tooth and a much larger sublateral tooth outwardly directed; outer clasper small, fingerlike, black. Antennæ of ♂ about half as long as body.

Dolichopeza (Nesopeza) defecta sp. n. (Pl. XII, fig. 17).

♂. *Head* wholly light ochreous, dull; palpi and antennæ not much darkened. Front about half as broad as one eye. Antennæ half as long as body; flagellar segments cylindrical, with short pubescence, each (except first) with a single longish dorsal hair near tip. *Thorax* uniformly brownish-ochreous, dull. *Abdomen* mainly brownish-ochreous, last few segments darker at sides. Hypopygium small, pale; tergite with the median black tooth long, equal to the triangular lateral teeth; sternite not produced; outer style small, narrow, pale. *Legs* (only a middle leg preserved) with femur pale ochreous with narrow blackish tip; tibia pale ochreous on basal two-thirds, whitish on apical-third, but with tip narrowly black; tarsus wholly white. *Wings* (pl. xii, fig. 17) rather broad, with a conspicuous and extensive light brown and white pattern somewhat resembling that of *D.* (*N.*) *perpulchra* Edw. (of Sarawak), but the white areas more extensive and the pale brownish ground-colour correspondingly reduced; no dark areas at tips of veins *An* and *Ax*. *Rs* as in *N. perpulchra*, without spur at base; cell *R3* much as in *N. gracilis* and allied species, very wide in middle and contracted at tip;

cell *M1* very wide, *M1* and *M2* both with the tips slightly curved downwards; *M3* or *M4* absent; cell *M4* of equal width throughout. Halteres mainly pale.

Length of body, 8.5 mm.; wing, 10 mm.

Kamborangah, 1 ♂.

The most remarkable feature of this insect is the absence of one of the branches of the media, which may be either *M3* or perhaps more probably *M4*. This however is certainly only a matter of secondary importance, as the species evidently belongs to the *gracilis* group of the subgenus *Nesopeza* and is intermediate between *N. gracilis* and *N. perpulchra*.

Dolichopeza (Nesopeza) epiphragmoides sp. n. (Pl. XII, fig. 18).

♀. *Head* brownish-ochreous, rather darker on nape and rostrum. Front about half as broad as one eye. Palpi dark brown. Antennæ as long as thorax, brownish, first flagellar segment and bases of the next few segments lighter; flagellar segments each (except first) with a single long postmedian dorsal hair, first quite twice as long as second. *Thorax* light brownish, slightly shining above; pteropleurite whitish, pleurotergite dark brown. *Abdomen* brownish, without definite markings. *Legs* missing. *Wings* (pl. xii, fig. 18) with an elaborate and very distinctive pattern (see figure) which is strongly reminiscent of *Epiphragma*. Venation much as in the last species, cell *R3* being wide in middle and much narrowed apically, and one of the branches of *M* lacking. Halteres with pale stem and dark knob.

Length of body, 10 mm.; wing, 9.5 mm.

Lumu Lumu, 1 ♀.

Dolichopeza (Nesopeza) triguttata sp. n. (Pl. XII, fig. 16).

♂. *Head* black, dusted with dark grey; rostrum and palpi black. Front broad. Antennæ black, except for the brownish second segment, not quite half as long as body; flagellar segments cylindrical, with very short pubescence and scarcely any longer hairs, first not much longer than second. *Thorax* blackish, the præscutal stripes indistinctly separated by greyish lines, shoulders obscurely ochreous; hair scanty and pale, postnotum almost bare. *Abdomen* almost black, segments 3—6 lighter and more shining on basal half. Hypopygium black; tergite depressed in middle, with the usual median and sublateral teeth, the latter bluntly rounded; outer claspers short, broad, and infolded. *Legs* (middle pair missing) blackish, including whole of tarsi, only trochanters and bases of femora ochreous. *Wings* pl. xii, fig. 16) blackish, lighter in middle on posterior half, with three conspicuous whitish areas, one near base of upper basal cell and extending indefinitely to hind margin, one (the largest) near outer end of upper basal cell and crossing veins *Rs* and *M*, the third (much smaller) before middle of cell *R3*. *Rs* very long (quite four times as long as the short *m-cu*) but without spur near base; *R2* +*3* and *R4* + *5* nearly straight, basal section of *R4* + *5* rather long, straight and oblique; cell *M1* only slightly longer than its stem; cell *M4* of uniform width throughout. Halteres with black knob, stem lighter.

Length of body, 7.5 mm.; wing, 10 mm.

Pakka, 2 ♂, 1 ♀.

Very distinct from other known species by wing-markings. In the female (which is immature and damaged) the antennæ are much shorter and the third pale area of the wing much larger, extending from costa to *M1* + *2*.

Sphærionotus vittatus sp. n.

♀. *Head* blackish above and somewhat shining, a small area adjacent to eyes at sides covered with brown pollen; face and a small area above root of antennæ orange. Antennæ with scape orange, flagellum black. Palpi dark brown, distinctly 3-segmented, first two segments each longer than broad, third shorter. *Thorax* almost uniformly ochreous, without obvious stripes, dorsum somewhat shining; a small black dot in middle of pleuræ, and a minute oval black spot immediately above wing-root. *Abdomen* ochreous, with a rectangular black mark on each tergite, not quite reaching base, and leaving sides broadly ochreous, these marks forming an interrupted black dorsal stripe; venter with a similar but narrower stripe. Ovipositor very short, cerci pubescent but chitinised. *Legs* black, femora brownish except at tips. *Wings* light brown, stigma dark brown. Discal cell not pointed at tip (as it is in *S. fasciatus* Edw.); cell *M1* slightly longer than its stem. Halteres blackish.

Length of body, 22 mm.; wing, 18.5 mm.

Lumu Lumu, 5,500 ft., 1 ♀.

Differs from both the other known species (*S. curtipennis*, de Meij., of Sumatra, and *S. fasciatus*, Edw., of Malaya) in the blackish vertex and markings of abdomen.

Ctenacroscelis festivipennis sp. n. (Pl. XII, fig. 20).

♀. *Head* fulvous, somewhat darker above and at sides of rostrum, but without distinct markings. Nasus rather long. Palpi dark brown. Antennæ brown, darker apically; flagellum 10-segmented, without long hairs, first three segments subequal, rest gradually shortened, 6—8 slightly shorter than 9 or 10; all segments nearly cylindrical, not enlarged beneath. *Thorax* with fulvous ground colour;

pronotum darkened above; præscutum with four more greyish stripes, outlined with dark brown, inner margins of middle pair of stripes in contact and forming a dark median line; scutum with four greyish areas outlined with dark brown; postnotum slightly darker above than at sides. An ill-defined dark brown area on neck and on upper part of anepisternite, but as usual leaving a light ochreous stripe from prothoracic spiracle to below root of wing. Pleurotergites not lighter than adjoining areas of pleuræ. *Abdomen* ochreous-brown, apical half of tergite 2 and whole of 3—7 somewhat darker. *Legs* brownish-ochreous; femora with a narrow brown preapical ring; last few tarsal segments blackened. First tarsal segment shorter than tibia. *Wings* (pl. xii, fig. 20) largely brown, with darker brown seams over vein *Ax*, *m-cu*, distal part of *Cu*, outer end of discal cell, and base of cell *M1*, and indicatious of a darker cloud in middle of cell *Cu2*. Stigma pale ochreous, preceded and followed by small whitish areas. A rather large whitish area over arculus. Extensive pale areas in lower half of wings. Cell *M1* with very short stalk; *r* joining *R2 + 3* just before the fork. Halteres ochreous.

Length of body, 31 mm.; wing, 33 mm.

Lumu Lumu, 5.500 ft., 1 ♀.

This is perhaps most nearly allied to *C. punctipennis* Edw. (Sarawak), which differs in having the pale markings of the wings much less extensive, thorax darker, but with conspicuously pale pleurotergites, etc. *C. dohrinianus* End. (Sumatra) is also similar, but has quite distinct wing-markings.

Tipula (Nippotipula) xanthostigma sp. n. (Pl. XII, fig. 21).

♀. Nearly allied to *T.* (*N.*) *pulcherrima* Brun. (Western Himalayas), differing as follows:—Size rather smaller. Pronotum rounded (in a paratype of *T.* (*N.*) *pulcherrima* in the British Museum it has a conspicuous median longitudinal furrow). Double median stripe of præscutum broader, being distinctly broader instead of narrower than the hairy præscutal interspaces. Femora largely brownish, with two distinct pale rings, one at tip and one some distance before tip, separated by a conspicuous dark brown ring. *Wings* (pl. xii, fig. 21) with an orange centre to stigma, but markings otherwise similar; *r-m* exactly at fork of *Rs*.

Length of body, 25—28 mm.; wing, 18—21 mm.

Lumu Lumu, 5,500, 5 ♀; Marei Parei, 5,000 ft., 1 ♀.

From the Malayan *T.* (*N.*) *anastomosa* Edw. this new species is very distinct by the thoracic markings, largely yellowish antennal flagellum, and more extensive wing-markings.

Tipula (Indotipula) kinabaluensis sp. n.

Head dark greyish-brown, with a median black line, and a small suffused blackish spot adjoining each eye a little above antennæ. Rostrum ochreous, not obviously darker on sides, but the rather long nasus blackish. Antennæ in both sexes about as long as thorax; scape ochreous, flagellum mostly dark brown, but with first few segments lighter apically; verticils very long, pubescence short; in ♂ most of the segments are slightly enlarged beneath near their tips, somewhat as in *T. sulaica* Walk., though to a less extent, in ♀ this swelling is not noticeable. *Thorax* with brownish-ochreous ground-colour, dusted over with the same colour; præscutum with four dull dark chocolate-brown stripes which are almost completely fused, leaving a pair of elongate greyish-ochreous triangles on hind margin of præscutum; scutum with two pairs of dark chocolate-brown marks occupying most of the surface; scutellum with a median blackish line; pleuræ dark in middle and also on lower part of sternopleura; lower half of meron also darkened, but not conspicuously. *Abdomen* dark brown, without obvious markings, but second segment and posterior margins of the others lighter. Hypopygium with the pair of processes of the tergite entirely black, pointed and finely spinulose; outer style large, broad, rather dark in colour, rounded at tip; sternite as seen in side view with a small peg-like projection. *Legs* rather dark brown, tips of femora and tibiæ black; spurs 0. 0. 2, one spur of hind tibia fairly long, the other very short, perhaps sometimes absent. *Wings* with a strong brown tingé, without any trace of clearer areas before or beyond stigma; costal cell and stigma deeper brown, but with a yellowish tinge. Axillary cell not quite so narrow as in some species of this group, distinctly though very slightly widened in middle. Halteres brownish.

Length of body, 13 mm. (♂)—21 mm. (♀); wing, 18—20 mm.

Kamborangah, 4 ♂; Lumu Lumu, 2 ♂ 1 ♀; Pakka, 1 ♂.

T. kinabaluensis is closely allied to *T. sulaica* Walk. (Sula to Sarawak) and *T. walkeri* Brun. (N. India), all having the ninth tergite of the male similar in form, but differing in the ornamentation of the thorax, darker wings with broader axillary area, etc.

Tipula (Acutipula) quadrinotata Brun.

Kamborangah, 1 ♀; Kenokok, 1 ♀.

Tipula (Formotipula) cinereifrons de Meij. ?

Kenokok, 1 ♂, 1 ♀; Tenompok Pass, 1 ♀.

The hypopygium differs rather notably from that of a male from Malaya in the British Museum, but which (if either) of these represents the true *T. cinereifrons* must remain undecided for the present.

Tipula (Formotipula) dusun sp. n.

♀. Allied to *T. cinereifrons* de Meij., differing as follows:—Head greenish-grey rather than ash-grey. Second antennal segment more distinctly yellow, contrasting with the black flagellum and first segment. Posterior division of prothorax blackened at sides; area on each side of scutellum also blackened; a small black triangle between præscutum and scutum. Ovipositor differently constructed, with much larger pubescent knobs on tergite. Traces of a median longitudinal dark line on tergites 2—4. Legs rather more slender and yellower, femora not darkened at tips. Wings with a strong brown tinge, stigma scarcely darker than ground colour.

Length of body, 13.5 mm.; wing, 16 mm.

Kenokok, 3,300 ft., 1 ♀.

Tipula (Schummelia) pendleburyi sp. n. (Pl. XII, fig. 22).

♀. *Head* light brownish, more orange above antennæ. Front without trace of tubercle, about two-thirds as broad as one eye. Rostrum light brownish, with very short nasus. Palpi blackish. Antennæ about as long as thorax; scape orange, flagellum blackish, not distinctly ringed. *Thorax* rather dark brownish, middle of pronotum, three præscutal stripes and scutellum lighter brown, but pleuræ almost uniformly dark. Postnotum with black hair. *Abdomen* with first tergite light brownish, second dark brown with a light brown band at base and another beyond middle, remainder light brown with dark brown apical bands, ovipositor light brown. Cerci long and slender. *Legs* rather light brown; hind coxæ dark; femora not darkened apically. Tibial spurs 1. 2. 2. *Wings* (pl. xii, fig. 22) with slight brown tinge; stigma blackish; clearer areas before and beyond stigma and over discal cell; broad dark brown seams over *m-cu*, distal part of *Cu* and *Ax;* less conspicuous seams over other veins in apex of wing; a brown cloud filling most of cells *R2* and *R3,* and another over stem of cell *M1* and filling base of this cell; a small clear area at tip of upper basal cell; arculus yellowish. Venation: *Rs* only as long as the small discal cell; *R2* complete; cell *M1* about three times as long as its stem; cell *M4* very long, very narrow apically. Halteres yellow, end of stem and base of knob blackened. Squama with a large clump of hairs.

Length of body, 12 mm.; wing, 12 mm.

Lumu Lumu, 5,500 ft., 2 ♀.

Belongs to the *annulicornis*-group, differing from other somewhat similar species in the markings of the thorax and wings. It is perhaps most nearly allied to *T. klossi* Edw. of Malaya.

Nephrotoma ridleyi Edw.

Kenokok, 1 ♀; Kiau, 2 ♀.

Nephrotoma cinereifrons sp. n.

♀. *Head* heavily dusted with pale grey; underlying integument mostly black above, a small area on nape, the low frontal tubercle, and upper surface of rostrum yellow, sides of rostrum black, nasus less heavily dusted than remainder of head and therefore appearing yellow. Palpi black. Antennæ mainly yellow, flagellar segments faintly darkened at base. *Thorax* uniformly dull orange-yellow. *Abdomen* almost uniformly ochreous, segments 6 and 7 indistinctly darkened; cerci of moderate length, rounded at tip. *Legs* orange-yellow, tibiæ and tarsi darkened. *Wings* with slight yellowish tinge, stigma scarcely darker, veins not very dark. Cell *M1* rather broadly sessile; fork of *M3* + *4* slightly beyond base of discal cell, which is rather long; *m-cu* joining *M4* a little beyond the fork. Halteres ochreous, base of knob darkened.

Length of body, 14 mm.; wing, 15 mm.

Lumu Lumu, 5,500 ft., 1 ♀.

This very distinct and interesting species has a remarkable superficial resemblance to *Tipula cinereifrons* de Meij.

Nephrotoma whiteheadi sp. n.

♂ ♀. *Head* dull yellow, with a rather large black area on nape, a small black spot adjacent to eye above root of each antenna, and a small black area on upper surface of rostrum, including nasus. Palpi black. Antennæ with scape yellowish, flagellum black; in ♂ slightly longer than head and thorax together, flagellar segments only very slightly enlarged at base beneath. *Thorax* mostly shining, prothorax and scutellum dull. Prothorax yellow above, black at sides. Præscutum with three broad but separate shining black stripes, all distinctly outlined with dull black, middle stripe also divided by a rather broad dull black line; a large subquadrate dull blackish area adjacent to anterior end of each lateral stripe and extending to lateral margin. scutum with two shining black areas, outlined with dull black. Scutellum dull black, with small yellow area at base. Postnotum yellow, black apically; pleurotergites black above. Pleuræ yellow, an indistinctly darker area in middle but no black marks on mesosternum or meron. *Abdomen* ochreous, with tergite 1 black except at sides, 2—5 black apically, 6—8 entirely black. Hypopygium of ♂ largely black; claspers not large, rounded at tips, dark; ninth sternite with numerous long yellow hairs. Ovipositor of ♀ ochreous, cerci rather short, round-tipped. *Legs* with coxæ ochreous, front and hind pairs more or less blackened at base; femora brownish-ochreous, tibiæ and tarsi darker. *Wings* faintly brownish, in some specimens indistinctly darker apically, especially towards costal margin; stigma dark brown, pubescent; veins dark. Cell *M1* broadly sessile; discal cell rather large and long. Halteres brownish.

Length of body, ♂ 11, ♀ 15 mm.; wing, 13—15 mm.

Lumu Lumu, 1 ♂ 3 ♀; Kamborangah, 2 ♂.

Allied to *N. siamensis* Edw., differing chiefly in the presence of large dull black areas at sides of lateral præscutal stripes.

EXPLANATION OF PLATE XII.

Wings of Nematocera from Mt. Kinabalu.

Fig. 1. *Macrocera picturata* sp. n., p. 225.
2. ,, *ephemeraeformis* Alex., p. 225.
3. ,, *trinubila* sp. n., p. 225.
4. *Eumanota leucura* gen. et sp. n., p. 232.
5. *Anisopus borneanus* sp. n., p. 246.
6. *Limonia chaseni* sp. n., p. 260.
7. ,, *kinabaluana* sp. n., p. 266.
8. ,, *lateromacula* sp. n., p. 259.
9. ,, *paragus* sp. n., p. 267.
10. ,, *epiphragmoides* sp. n., p. 268.
11. *Limnophila guttularis* Edw., var., p. 283.
12. ,, *pakkana* sp. n., p. 283.
13. ,, *concreta* sp. n., p. 283.
14. *Nipponomyia flavicollis* sp. n., p. 286.
15. *Dolichopeza caloptera* Edw. (North Borneo lowlands).*
16. ,, *triguttata* sp. n., p. 289.
17. ,, *defecta* sp. n., p. 288.
18. ,, *epiphragmoides* sp. n., p. 289.
19. ,, *major* Edw., p. 288.
20. *Ctenacroscelis festivipennis* sp. n., p. 290.
21. *Tipula xanthostigma* sp. n., p. 291.
22. ,, *pendleburyi* sp. n., p. 293.

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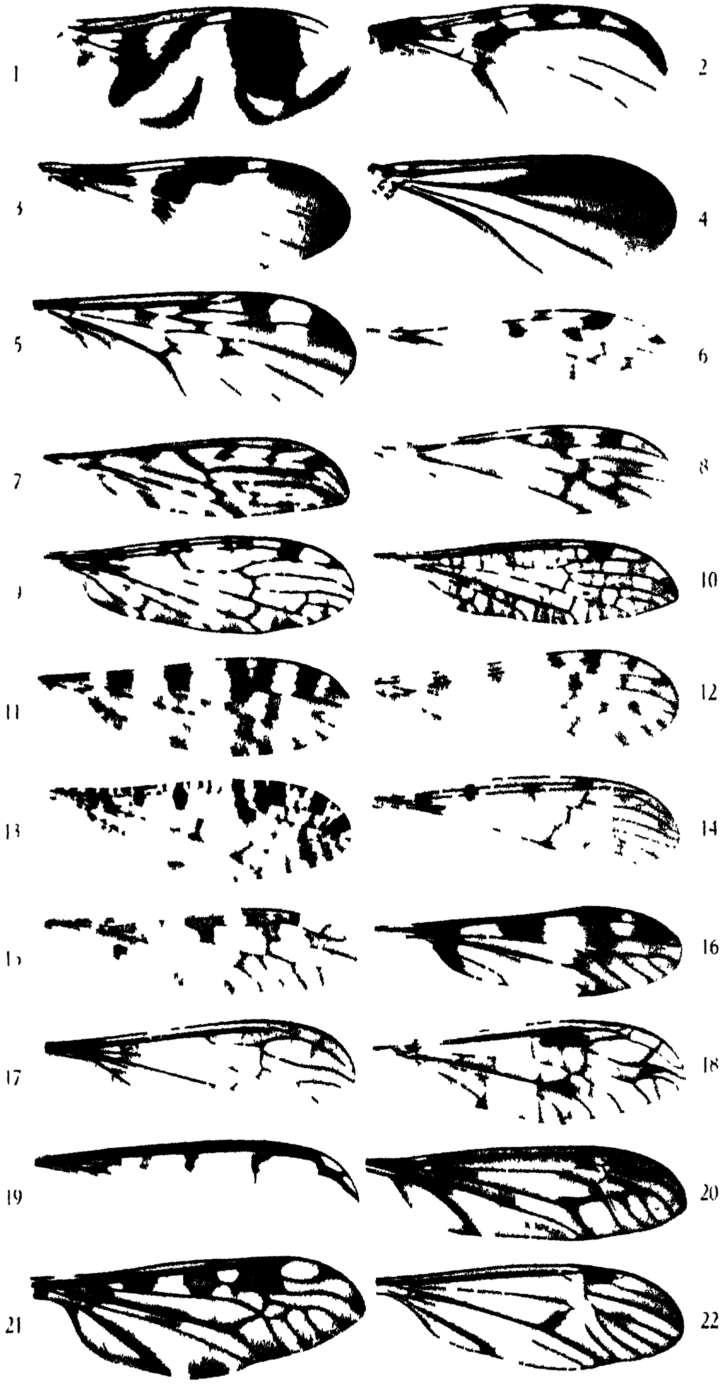
*Journ. F.M.S. Mus., XVI, 1931, p. 503.



Nematocera from Mt. Kinabalu

XXI. THE BLATTIDÆ OF MOUNT KINABALU, BRITISH NORTH BORNEO.

By R. HANITSCH, *PH.D.*

(With twenty four text figures).

The collection of Blattidæ from Mount Kinabalu, made by Captain H. M. Pendlebury in the year 1929, comprises 61 species, of which 12 are here described as new. Accounts of some of the other groups collected have already been published in this *Journal*, together with a narrative of the journey, beautifully illustrated, by Captain Pendlebury and Mr. F. N. Chasen, the other member of the expedition. The two authors speak in their introduction of the " very specialized fauna " of the mountain, and this sentiment is re-echoed by several of the specialists who have worked out the different groups. Robinson and Kloss,[1] some years before them, in describing the birds of Korinchi, the highest mountain in Sumatra, compare its fauna with that of Kinabalu and state that " the peculiar elements in the fauna of Kinabalu and of Borneo generally are far more differentiated than those of any other district in Indo-Malaya." I am afraid I am unable to concur at least as regards Cockroaches. Whilst fully acknowledging the wealth of the material brought home, showing quite exceptional care in collecting and preserving under great difficulties—and no one can appreciate this more than one who himself once made a very partially successful attempt to climb Kinabalu ——, the collection contains little that could not have been expected. Certainly, it is easy enough to enumerate a number of species of Blattids which seem peculiar to Borneo —and even one genus[2]—but Kinabalu itself hardly occupies an isolated position on the island. Some years ago I described a collection of Blattids from Northern Sarawak, chiefly Mt. Murud and Mt. Dulit, made by Dr. Eric Mjöberg between October, 1922 and January, 1923.[3] It comprised 55 species, of which 24 proved new to science, whilst 7 species were fresh records for Borneo. A considerable proportion, viz. 23 species, were taken on Mt. Murud[4] at an altitude of 6,500 ft.; therefore nearly at the same height as the present collection from Kinabalu which includes 19 species of an altitude up to 7,000 feet and only 3 species above it. The Blattid faunas of the two mountains can therefore well be compared, and the similarity between them is certainly striking. Out of the 55 species found on Mt. Murud, 23 species were taken again on Kinabalu, including 10 species described as new from the former mountain. Another 7 species now recorded from Kinabalu, had first been described by Shelford from other parts of Borneo, chiefly Sarawak, and two additional species by myself. However, in order to allow of a rapid comparison of the Blattid fauna of Kinabalu with that of Malaysia generally, I am including in the list of species, besides their elevation, their distribution also. Sixteen species were taken at Kabayau, a few miles from the foot of Kinabalu, only little above sea-level, but six of them were found again on Kinabalu proper, at heights ranging from 3,000 feet to 7,000 feet.

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[1] Results of an Expedition to Korinchi Peak, Sumatra. In: " Journal of the Federated Malay States Museums," Vol. VIII (1918), p. 98.

[2] The genus *Miroblatta* Shelford, is so far known from Borneo only.

[3] Sarawak Museum Journal, Vol. III (1925), pp. 75—106, 18 figs.

[4] The labels bore no indication of the altitude at which the Mt. Dulit specimens were taken.

Before proceeding to the descriptive part of this paper, a few points of special interest may be selected:—

The collection contains 17 ♂ ♂, but no ♀ ♀ of *Pseudophoraspis emarginata*, Hanitsch, a species which I first described from a single ♂ from Long Akar, Baram River, Sarawak (J., M.B., R. Asiat. Soc., Vol. I, 1923, p. 424, figs. 16 and 17). It occurs at all altitudes from 600 feet to 5,500 feet. The ♀ is unknown as yet. Dare one suggest that the large numbers of immature examples of both sexes of *Rhicnoda natatrix* Shelford, taken at similar altitudes, represent younger stages of *P. emarginata*, and that we have here another case of sexual dimorphism, not uncommon amongst Blattids? No adult ♀ of *R. natatrix* was taken on this expedition, in fact the only known adult examples are Shelford's type from Sarawak, now in the Oxford Museum, and one from the Bajau River, E. Borneo (E. Mjöberg, 1924), which is in the Stockholm Museum.—Funkhouser, in his paper on the Membracidæ of Kinabalu (this *Journal*, Vol. XVII, part 1, Sept., 1932, p. 112) encountered a similar difficulty. He describes a series of 27 ♂ ♂ of *Pyrgauchenia brunnea* sp. n., and 10 ♀ ♀ of *P. angulata* sp. n., "all thirty-seven specimens collected at the same locality on the same dates." One who, however, has absolutely no knowledge of this group of insects, would think it almost overcautious not to regard them as the opposite sexes of the same species.

A new species of *Salganea* Stal. viz. *S. inaequaliterspinosa* mihi, is represented by a ♂ from Kiau—Tenompok, 3,000 feet—4,700 feet, and a long series of 16 ♂ ♂ and 26 ♀ ♀ from Lumu Lumu, 5,500 feet. It is extraordinary that a species so well-marked as the present, with its striking supra-anal lamina, and occurring in such profusion in one locality, should have remained unknown so long. However, this Blattid is not restricted to Kinabalu, as I have specimens from several mountains in Sarawak before me.

The Blattids taken at the highest altitudes, were *Margattea crucifera* Hanitsch, viz. 1 ♂ from Pakka, 10,000 feet, but also represented by 4 ♂ ♂ from Lumu Lumu, 5,500 feet; and *Ceratinoptera baluensis* sp. n., with 7 ♂ ♂ and 9 ♀ ♀ from Pakka, 10,000 feet, besides three examples from lower altitudes, 5,000 feet to 7,000 feet. The similarity with the Blattids from the mountains of Sarawak is unmistakable. I first described *M. crucifera*[5] from two ♂ ♂ from Mt. Murud, 6,500 feet, and one ♀ from Mt. Dulit, whilst *C. baluensis* is closely allied to *C.* (*Allacta*) *microptera* Hanitsch[6] represented by one ♂ from " Mt. Murud, top."[7] In this latter species, however, both tegmina and wings are still further reduced than in *C. baluensis.* None of these Blattids is known from altitudes below 5,000 feet.

It is surprising that no species of *Morphna* Shelford, was taken on Kinabalu. I had expected to find at least *M. mjöbergi* Hanitsch,[8] in the collection, one of the largest and most striking of Bornean Blattids. I described that species first from a long series (4 ♂ ♂, 9 ♀ ♀), taken by Mjöberg on Mt. Dulit, and I have since seen another series from the Stockholm Museum, viz. 4 ♂ ♂ and 4 ♀ ♀ from the Pajau River, E. Borneo, and 1 ♂ from Long Navang, taken by Mjöberg in 1924. However, it is interesting to note that that species is not known from Mt. Murud either, a negative character of agreement with Kinabalu.

Pseudophyllodromia laticeps Walker, a smallish species, readily recognized by its broad head and broad pronotum, is apparently common in some parts of Malaysia. The Oxford University Museum possesses, besides the type, from Singapore, several examples from the Malay Peninsula and a series of more than 20 specimens from Kuching, Sarawak (R. Shelford, 1899—1900). Captain Pendlebury very kindly pointed out to me that the Blattid from the foot of Kinabalu which at the preliminary sorting of the material I had taken for *laticeps*, differed in several points from that species. It proved to be *Pseudophyllodromia* (*Phyllodromia*) *laticaput* Brunner, a name long buried in misapplied synonymy. However, *laticaput* is by no means peculiar to Kinabalu; in fact, it seems to be a low-country form. Not only Brunner's and the present material, but also examples I have seen from Sandakan, B. N. Borneo, were apparently all taken at only little above sea-level. It is interesting that study of other collections has brought to light two or three other species of *Pseudophyllodromia*, one from the Mentawi Islands, and one or two from Mt. Poi, Sarawak, which I describe below. However, whether all these forms really deserve specific rank, or whether they should be regarded as geographical races, can only be decided when more material is available.

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[5] Sarawak Mus. J., Vol. III (1925), p. 85.

[6] loc. cit., p. 89.

[7] Thus the label. This would mean about 8,000 feet above sea-level.

[8] loc. cit., p. 90, fig. 7.

The several species of *Perisphaeria* and *Pseudoglomeris* have always offered difficulty in associating the two sexes. The males are comparatively slender, winged Insects, the females wing-less, woodlice-like. The females are always more common in collections than the more agile males. The present collection is no exception. The females can be determined without much difficulty—for the specific descriptions are generally based upon them; with the males determination is to a great extent guess-work. So whether the three males which I have placed under *Perisphaeria armadillo* Serville, are correctly named, I cannot say with absolute certainty.—The collection contains also several examples of an undescribed *Perisphaeria*, viz. *P. rubescens* sp. n., both ♂ ♂ and ♀ ♀, but unfortunately the ♂ ♂ all immature. Finally there is a ♂ of a new species of the rare *Glyptopeltis* Saussure, so far known from Java only, which differs from *Perisphaeria* Serville and *Pseudoglomeris* Brunner by the eyes being far apart.

Very interesting is a surprisingly long series of a *Panesthia* which to my knowledge has never been taken before in Borneo, Sumatra, or on the Malay Peninsula, and which I regard as a subspecies of *P. brevipennis* Brunner, from Amboina. It is not known from Mt. Murud and Mt. Dulit, but there occurs a closely allied, yet distinct species on Mt. Penrissen, in Southern Sarawak, which I describe below as *P. penrissensis*. Two Blattids, from Java and Ceram respectively, mentioned later on, stand nearer to the subspecies from Kinabalu. This *P. brevipennis baluensis* subsp. n. is one of the few forms which really seems peculiar to Kinabalu.

Larval forms of *Rhicnoda natatrix* Shelford, seem as common in the mountain streams of Kinabalu, as they are in Sarawak. The present collection contains a series of another aquatic species in addition, all taken at 7,000 feet, but unfortunately all immature. This species which I describe below under the name of *Epilampra demergens* sp. n., can be separated readily from *R. natatrix* by the head being exposed and by the shape of its supra-anal lamina. It too shows externally no modification for aquatic life, and especially its legs differ in no way from those of purely terrestrial forms. But the most extraordinary point about these two Blattids, *E. demergens* and *R. natatrix*, is that the youngest ♀♀ stages bear styles. In "Annali, Mus. Civico," Genoa, Vol. LVI (1932), p. 90, I have described and figured ♂ larvæ of a *Miopanesthia* with styles, though styles in the subfamily of the Panesthinæ had hitherto been unknown. Whether all Blattidæ of both sexes bear styles in their earliest stages, I have to leave undecided for the present.

For the sake of comparison I have included in this paper the description of a few new species which were not taken on Kinabalu, viz. one from the Malay Peninsula, another from the Mentawi Islands, and two from Sarawak.

As in my other recent papers I have adopted here the genera *Dyakina, Plumiger, Symploce, Parasymploce* and *Symplocodes,* established by Hebard in Proc., Acad. Nat. Sci., Philadelphia, Vol. LXXXI (1929), pp. 1—109.

The types of the new species described will, with Captain Pendlebury's generous permission, be preserved in the Hope Department, University Museum, Oxford.

In conclusion I wish to repeat my sincerest thanks, so often expressed on former occasions, to Professor Poulton, F.R.S., for so kindly allowing me to carry on my favourite study in his Department.

Oxford,
December, 1932.

LIST OF SPECIES.

N.B.—The species in brackets [ ] were not taken on Mount Kinabalu.

	Altitude.	Distribution.
Ectobiinæ.		
Dyakina apicigera Walker p. 305	3,000 ft.— 4,700 ft.	Ma.
Plumiger histrio Burmeister p. 305	600 ft.	Malaysia; Celebes.
Mareta stellata Hanitsch p. 305	3,000 ft.	Malay Peninsula.
Mareta jacobsoni Hebard p. 305	3,000 ft.	Malay Pen.; Sumatra.
Anaplectinæ.		
Anaplecta cornea Hanitsch p. 306	5,500 ft.— 7,000 ft.	Malay Pen.; Sumatra; Borneo.
Anaplecta maculifera Hanitsch p. 306	4,700 ft.— 7,000 ft.	Borneo; Sumatra.
Pseudomopinæ.		
Blattella bisignata Brunner p. 306	600 ft.	Burma; Malaysia.
Blattela cunei-vittata Hanitsch p. 306	3,000 ft.— 7,000 ft.	Borneo.
Symploce excavata Shelford p. 307	600 ft.	Borneo; Mal. Peninsula.
Symploce falcifera Hanitsch p. 307	600 ft.	Borneo; Mal. Pen.; Sumatra.
Symploce radicifera Hanitsch p. 308	600 ft.	Mal. Pen.; Sumatra; Borneo; Bali.
Parasymploce irregulariter-vittata Brunner p. 308	5,000 ft.— 7,000 ft.	Borneo; Java; Sumatr Mentawi I.
Parasymploce hewitti Shelford p. 308	3,300 ft.	Borneo; Mal. Pen.; Sumatra.
Parasymploce interrupta sp. n. p. 308	3,300 ft.	Kinabalu.
[*Parasymploce marginalis* sp. n. p. 310	Lowlands	Kedah, Mal. Pen.]
Symplocodes ridleyi Shelford p. 310	3,000 ft.	Borneo; Mal. Pen.; Sumatra; Bali.
Margattea anceps Krauss p. 310	5,000 ft.— 7,000 ft.	Malaysia.
Margattea ceylonica Saussure p. 310	600 ft.	Ceylon; Mal. Pen.; Sumatra; Borneo.
Margattea crucifera Hanitsch p. 310	5,500 ft.— 10,000 ft.	Borneo.
Margattea nebulosa Shelford p. 311	5,000 ft.— 7,000 ft.	Borneo.
Pseudophyllodromia laticaput Brunner p. 311	600 ft.	Borneo.
[*Pseudophyllodromia mentawiensis* sp. n. p. 313	Lowlands	Mentawi I.]
[*Pseudophyllodromia poiensis* sp. n. p 313	4,500 ft.— 5,350 ft.	Mt. Poi, Sarawak.]
[*Pseudophyllodromia poiensis lacta* subsp. n. p. 313	5,450 ft.	Mt. Poi, Sarawak.]
Pseudophyllodromia pulcherrima Shelford p. 314	600 ft.— 3,000 ft.	Borneo.
Liosilphoidea lata Hanitsch p. 314	7,000 ft.	Borneo; Mal. Pen.; Sumatra; N. Guinea.

LIST OF SPECIES:—*Contd.*

	Altitude.	Distribution.
Chroisoblatta confluens Hanitsch p. 314	5,500 ft.	Borneo.
Ceratinoptera baluensis sp. n. p. 314 ..	5,000 ft.— 10,000 ft.	Kinabalu.
Ceratinoptera bipunctata sp. n. p. 316 ..	7,000 ft.	Kinabalu.
Dictyoblatta bimaculata Hanitsch p. 317	600 ft.	Mal. Pen.; Mentawi I.
Epilamprinæ.		
Pseudophoraspis nebulosa Burmeister p. 317	3,000 ft.	Malaysia.
Pseudophoraspis emarginata Hanitsch p. 317	600 ft.— 5,500 ft.	Borneo.
Pseudophoraspis testudinaria Hanitsch p. 317	4,500 ft.— 7,000 ft.	Borneo.
Pseudophoraspis lacrimans sp. n. p. 318	3,000 ft.	Kinabalu.
Pseudophoraspis uniformis sp. n. p. 319	4,500 ft.	Kinabalu.
Rhabdoblatta procera Brunner p. 319 ..	3,000 ft.— 7,000 ft.	Malaysia; Celebes.
Stictolampra lurida Burmeister p. 319 ..	600 ft.— 3,300 ft.	India; Malaysia; Celebes.
Epilampra albina Saussure p. 320 ..	3,000 ft.— 7,000 ft.	Malaysia.
Epilampra communis Hanitsch p. 320 ..	3,000 ft.— 7,000 ft.	Mentawi I.; Mal. Pen.
Epilampra pendleburyi sp. n. p. 320 ..	3,000 ft.	Kinabalu.
Epilampra demergens sp. n. p. 321 ..	7,000 ft.	Kinabalu.
Rhicnoda natatrix Shelford p. 323 ..	3,300 ft.— 7,000 ft.	Borneo; (Mal. Pen. ?)
Blattinæ.		
Dorylaea flavicincta de Haan p. 326 ..	4,000 ft.	Malaysia; Formosa; Madagascar.
Blatta concinna de Haan p. 326 ..	3,000 ft.	India; Malaysia; Japan etc.
Periplaneta australasiae Fabr p. 326 ..	3,000 ft.— 3,300 ft.	Cosmopolitan.
Periplaneta montana Hanitsch p. 326 ..	3,000 ft.	Mal. Pen.; Sumatra; Mentawi I.
Periplaneta succinea Hanitsch p. 326 ..	3,500 ft.	Borneo; Mal. Pen.
Periplaneta blattoides sp. n. p. 327 ..	5,500 ft.	Kinabalu.
Catara rugosicollis Brunner p. 327 ..	3,000 ft.— 7,000 ft.	Malaysia.
Panchlorinæ.		
Pycnoscelus striatus Kirby p. 327 ..	5,500 ft.	Malay Peninsula.
Corydinæ.		
Homopteroidea nigra Shelford p. 328 ..	4,700 ft.— 7,000 ft.	Borneo; Sumatra; Malay Peninsula.
Homopteroidea shelfordi Hanitsch p. 328	4,700 ft.— 7,000 ft.	Borneo; Sumatra; Malay Peninsula.
Homopteroidea minor sp. n. p. 328 ..	3,300 ft.	Kinabalu.
Ctenoneura fulva Hanitsch p. 329 ..	3,300 ft.— 7,000 ft.	Borneo.
Oxyhaloinæ.		
Chorisoneura lativitrea Walker p. 329 ..	3,000 ft.	Cambodia; Mal. Pen.; Sumatra; Borneo; New Caledonia.

LIST OF SPECIES.—*Contd.*

	Altitude.	Distribution.
Perisphærinæ.		
Paranauphoeta lyrata Burmeister p. 329	3,000 ft.— 3,300 ft.	India; Malaysia; Celebes; Philippines.
Perisphaeria armadillo Serville p. 329 ..	600 ft.— 7,000 ft.	Malaysia; N. Guinea.
Perisphaeria rubescens sp. n. p. 330 ..	5,500 ft.— 8,500 ft.	Kinabalu.
Pseudoglomeris flavicornis Burmeister p. 331	5,500 ft.	India etc.; Mal. Pen.; Java; Borneo.
Glyptopeltis wallacei sp. n. p. 331 ..	3,000 ft.	Kinabalu.
Panesthinæ.		
Salganea morio Burmeister p. 332 ..	600 ft.— 3,300 ft.	Malaysia; Ceylon; Amboina.
Salganea inaequaliter-spinosa sp. n. p. 332	3,000 ft. 5,500 ft.	Kinabalu; Sarawak.
Panesthia javanica Serville p. 333 ..	600 ft.— 7,000 ft.	Malaysia; Burma etc.; Philippines.
Panesthia brevipennis baluensis Brunner subsp. n. p. 334	5,500 ft.— 7,000 ft.	Kinabalu.
[*Panesthia penrissenensis* sp. n. p. 335 ..	4,400 ft.	Mt. Penrissen, Sarawak].
Dolichosphaeria deplanata Hanitsch p. 336	3,000 ft.	Mal. Pen.; Sumatra.

ECTOBIINÆ.

Dyakina apicigera Walker.

1868. *Blatta apicigera* Walker, Cat. Blatt., B. M. p. 227 [Java].

1 example, Kiau—Tenompok Pass, 3,000 feet—4,700 feet. 18.3.1929.

1 example, Kiau, 3,000 feet. At light. 6.4.1929.

Distribution: the whole of Malaysia.

Plumiger histrio Burmeister.

1838. *Thyrsocera histrio* Burm., Handb. Entom., Vol. II, p. 499. [Java].

7 examples, Kabayau, 600 feet. May 8th—11th, 1929.

Distribution: the whole of Malaysia and Celebes.

Mareta stellata Hanitsch.

1923. *Phyllodromia stellata* Hanitsch, J., M. B., R. As. Soc., Vol. I, p. 413, fig. 13. [♀ Gunong Kledang, Perak]

1931. *Mareta stellata* Hanitsch, Ann. Mag. Nat. Hist. (10), Vol. VII, p. 388, figs. 1 and 2. [♂ Singapore].

1 example, Kiau, 3,000 feet. At light. 27.3.1929.

1 example, Kabayau, 600 feet. 9.5.1929.

This is the first record from Borneo. This species is readily recognized by the sharply defined black dots scattered over its tegmina.

Mareta jacobsoni Hebard.

1929. *Allactina jacobsoni* Hebard, Proc. Acad. Nat. Sci., Philadelphia, Vol. LXXXI, p. 19, pl. II, fig. 1. [♀ Fort de Kock, Sumatra].

1 ♂ Kiau, 3,000 feet. At light. 27.3.1929.

This is the first record of a ♂ of this species, though I have now two other ♂♂ examples before me, viz. one in the Oxford Museum collection, not named, bearing the label "Kuching, Capt. 1899 by Dyak collector, pres. by R. Shelford," and another specimen from Tandjong Redeb, E. Borneo, taken by E. Mjöberg and belonging to the Stockholm Museum. All previous examples recorded had been females, viz. besides the type, from Sumatra, also a specimen from Kuala Tahan, Pahang, mentioned by Hebard, and the various specimens which I enumerated in Tijdschr. voor Entom., Vol. LXXII (1929), p. 279, and of which I gave a re-description under the name of *Chorisoblatta jacobsoni*, viz. one specimen each from Fort de Kock, Sumatra, from Wai Lima, S. Sumatra, and from Singapore.—The armature of its front femora by piliform spines only, and the deeply divided sub-genital lamina of the ♂ clearly bring this species under *Mareta* Bolivar.

ANAPLECTINÆ.

Anaplecta cornea Hanitsch.

1925. Sarawak Museum J., Vol. III, p. 79, fig. 1.
[Mt. Murud and Mt. Dulit, Sarawak].

1 example, Lumu Lumu, 5,500 feet, 16.4.1929.

20 examples, Kamborangah, 7,000 feet, March—April, 1929.

This species also occurs on the Malay Peninsula whence I have seen several examples from Cameron Highlands, Pahang, 4,800 feet (H. M. Pendlebury, Oct. 1923 and March, 1924). Closely allied is a slightly smaller form, *minor* subsp., which I described from Fort de Kock, Sumatra (Tijdschr. voor Entom., Vol. LXXII (1929), p. 267).

Anaplecta maculifera Hanitsch.

1925. Sarawak Mus. J., Vol. III, p. 80, fig. 2.
[Mt. Murud, Sarawak].

2 examples, Tenompok Pass, 4,700 feet, 18.3.1929.

1 example, Lumu—Kamborangah, 5,000—7,000 feet, 20.3.1929.

1 example, Kamborangah, 7,000 feet, 7.4.1929.

9 examples, Lumu Lumu, 5,500 feet, 7 and 11.4.1929.

1 example, Marei Parei, 5,000 feet, 28.4.1929.

Apparently also common on Sumatra. I found this species in numbers in a collection made by E. Modigliani at Si-Rambé, in 1891, and at Bandar Barœ, Deli, by L. Fulmek, in 1926.

PSEUDOMOPINÆ.

Blattella bisignata Brunner.

1893. *Phyllodromia bisignata* Brunner, Ann. Mus. Civ. Genova, Vol. XXXIII, p. 15, pl. I, fig. 1.
[Bhamo, Burma].

1 ♂, 1 ♀, Kabayau, 600 feet. 9.5.1929.

Recorded by Hebard from Sumatra, Java and Borneo who in the same paper discusses its affinities to *B. germanica* L. (Proc. Acad. Nat. Sci., Philadelphia, Vol. LXXXI (1929), p. 60).

Blattella cunei-vittata Hanitsch (Fig. 1).

1925. *Phyllodromia cunei-vittata* Hanitsch, Sarawak Museum J., Vol. III, p. 86. [♀ Mt. Dulit, Sarawak].

3 ♀ ♀ Kamborangah, 7,000 feet. 26.3.1929.

1 ♀ Marei Parei, 5,000 feet, 3.4.1929.

3 ♀ ♀ Kenokok, 3,300 feet, 26.4.1929.

1 ♂ Kiau, 3,000 feet. At light. 1.5.1929.

The male which had not been known previously, may be described as follows:

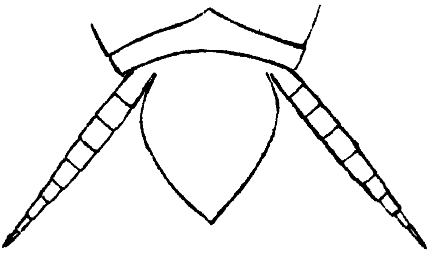

Fig. 1. *Blattella cunei-vittata* Hanitsch ♂. End of abdomen from above. Enlarged.

♂. Head free; occiput castaneous, vertex and frons black, with an indistinct lighter bar between the antennal sockets; labrum and palps fuscous; interocular distance 2/3 the width between the antennal sockets; a pair of chalk-white ocelli to the inside of the antennal sockets; antennæ dark fuscous. Pronotum with the anterior margin parabolic, posterior margin obtusely angled; dull testaceous, with two very broad cuneiform black vittæ, almost obliterating the testaceous space between them. Tegmina reaching only to the base of the supra-anal lamina, fusco-testaceous; 18 costals; radial vein bifurcate at ¾ from the base; 7 longitudinal discoidal sectors; 6 anals. Wings fuscous, costal area slightly darker; mediastinal vein 4-ramose; 8 costals, slightly clubbed; median vein single; ulnar vein single, almost straight; apical triangle hardly developed. Supra-anal lamina large, produced, leaf or spade-like, its apex sub-triangular. Cerci fuscous. Body below fuscous, darker at the sides. Sub-genital lamina large, trapezoid, posterior margin slightly emarginate. A single minute style on the left, with a long horny spine projecting from above it. Legs fusco-testaceous; front femora armed after type A.

♂. Total length 12.5 mm.

Symploce excavata Shelford.

1906. *Ischnoptera excavata* Shelf., Trans. Ent. Soc., London, p. 265, pl. XVI, fig. 11. [♂ Kuching, Sarawak].

1 ♀ Kabayau, 600 feet. 8.5.1929. Hebard (1929, p. 68) records a ♀ example from Mujang, Sarawak, and I have before me a ♂ from Cameron Highlands, Pahang, 4,800 feet (H. M. Pendlebury, 11.3.1924).

Symploce falcifera Hanitsch.

1925. *Ischnoptera falcifera* Hanitsch, Sarawak Mus. J., Vol. III, p. 81, fig. 4. [♂ Mt. Dulit, Sarawak; ♀ Kota Tinggi, Johore].

1 ♂ Kabayau, 600 feet. 14.3.1929.

1 ♀ ibid. 13.5.1929.

I have recorded this species also from Singapore and from Wai Lima, S. Sumatra (Ann. Mag. Nat. Hist., (10), Vol. VII (1931), p. 392), and have recently seen specimens from the Stockholm Museum, taken by E. Mjöberg on Mt. Tibang, Sarawak, 1,400 m., and at the Birang River, E. Borneo.

Symploce radicifera Hanitsch.

1928. *Neoblattella radicifera* Hanitsch, Bull. Raffles Mus., No. 1, p. 20. [♀ Padang, Sumatra].

1 ♂, 2 ♀, Kabayau, 600 feet. 9.5.1929.

A common species. I have recorded it from several places in Sumatra, the Malay Peninsula and Bali (Rèsultats Scientifiques du Voyage aux Indes Orientales Néelandaises, Vol. IV (1931), p. 45) and Hebard (1929, p. 61, pl. IV, fig. 4) also describes it from Sumatra, the Malay Peninsula and Sarawak.

Parasymploce irregulariter-vittata Brunner.

1898. *Phyllodromia irregulariter-vittata* Brunner, Abh. Senck. Ges., Vol. XXIV, p. 202, pl. XVI, fig. 1. [♀ Borneo; Java].

1929. *Parasymploce dichroa* Hebard, Proc. Acad. Nat. Sci., Philadelphia, Vol. LXXXI, p. 73, pl. IV, fig. 10. [♂ Simalur I., Sumatra].

11 ♂♂, 13 ♀♀ Kamborangah, 7,000 feet, March—April, 1929.

16 ♂♂, 6 ♀♀ Lumu Lumu, 5,500 feet, April, 1929.

1 ♂, 1 ♀ Marei Parei, 5,000 feet, May, 1929.

This species has now been recorded from Borneo, Java, Sumatra and the Mentawi Islands, but apparently not yet from the Malay Peninsula. See Annali Mus. Civ., Genoa, Vol. LVI (1932), p. 59.

Parasymploce hewitti Shelford.

1907. *Phyllodromia hewitti* Shelf., Ann. Mag. Nat. Hist. (7), Vol. XIX (1907), p. 33. [♂ Kuching, Sarawak].

1 ♀ Kenokok, 3,300 feet, 26.4.1929.

I have recorded this species from Mt. Murud and the Kalabit Country (Sarawak Mus. J., Vol. III (1925), p. 83), and have seen various examples from the Malay Peninsula (Selangor and Pahang). In all these specimens the wings are orange in colour, whilst in a closely allied form subsp. *fusca* Hanitsch from Sumatra and the Mentawi Islands the wings are fuscous. (Bulletin, Raffles Museum, No. 1 (1928), p. 18).

Parasymploce interrupta sp. n. (Fig. 2).

1 ♂, 1 ♀ Kenokok, 3,300 feet, 26.4.1929.

♂. Head slightly exposed, vertex reddish brown, frons shining black, labrum and palps testaceous, suffused with brown; interocular space 2/3 the distance between the antennal sockets; antennæ fuscous. Pronotum truncate in front, sides curved, greatest width behind the centre, posterior border obtusely angled; shining black, laterally with an irregular broad fulvous border, posterior border narrowly fulvous suffused. (Fig. 2). Tegmina exceeding the abdomen by fully 1/3 their length, castaneous; mediastinal area and adjoining 1/3 of the costal border pale fulvous; 18 costals, the last 3 or 4 of which are forked; radial vein forked from its middle; 8 longitudinal discoidal sectors. Wings fuscous, with the distal portion of the costal area golden yellow; mediastinal vein 5-ramose; 12 costals, of uniform thickness; radial vein forked from before its middle; median vein sigmoid, simple; ulnar vein sigmoid, 3-ramose; apical triangle fully developed, with the outer margin obtusely produced; 1st axillary vein 6-ramose. Abdomen above fusco-castaneous; supra-anal lamina large, triangular. Cerci pale testaceous. Abdomen below mottled fusco-testaceous; sub-genital lamina large, bluntly triangular, somewhat asymmetrical; on its left a narrow curved plate, ending in teeth; only the right style observed. Legs testaceous; front femora armed after type A.

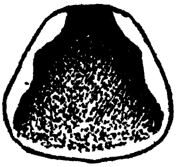

Fig. 2. *Parasymploce interrupta* sp. n.
Pronotum. Enlarged.

♀ Similar to the ♂. Sub-genital lamina castaneous, posterior margin broad, yellow.

	♂	♀
Total length	19 mm.	17.5 mm.
Body	13.5 „	12 „
Pronotum	4 × 5 „	3.5 × 4.8 „
Tegmina	15.5 „	14 „

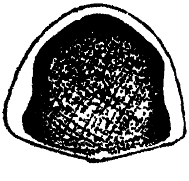

Fig. 3. *Parasymploce marginalis* sp. n.
Pronotum. Enlarged.

I have before me an example ♀ of a very similar species (near Jitra, Kedah, Malay Peninsula, H. M. Pendlebury, 7.4.1928), which differs from *interrupta* by the fulvous border of the pronotum being not "interrupted" in front, but continuous. I propose describing that species shortly under the name of *P. marginalis* sp. n. (Fig. 3).

Symplocodes ridleyi Shelford.

1912. *Hemithyrsocera ridleyi* Shelf., Trans. Ent. Soc., London, p. 600, pl. LXXX, fig. 15. [♂ Singapore].

1 ♀ Kiau, 3,000 feet. At light. 31.3.1929.

This is the first record from Borneo. This species is not uncommon on the Malay Peninsula and Sumatra, and I have recently recorded it also from Bali. (Résultats Scientifiques du Voyage aux Indes Orientales Néerlandaises, 1931, Vol. IV, p. 45).

Margattea anceps Krauss.

1903. *Blatta anceps* Krauss, Semon's Zool. Sorsch. Austral. u. Mal. Arch., Vol. V, p. 749. [♀ Tjibodas, Java].

1925. *Phyllodromia nigro-vittata* Hanitsch, Sarawak Mus. J., Vol. III, p. 88. [♂, ♀ Mt. Murud, Sarawak].

12 ♂♂, 13 ♀♀ Kamborangah, 7,000 feet, March—April, 1929.

27 ♂♂, 10 ♀♀ Lumu Lumu, 5,500 feet, April, 1929.

1 ♂, 1 ♀ Marei Parei, 5,000 feet, April—May, 1929.

This species which Hebard places under his *Kuchinga*, has now been recorded from all parts of Malaysia. See Tijdschr, voor Entom., Vol. LXXII (1929), p. 276.

Margattea ceylonica Saussure.

1868. *Blatta ceylonica* Sauss., Rev. Zool. (2), Vol. XX, p. 355. [Ceylon.]

1869. *Blatta ceylonica* Sauss., Mem. Soc. Genève, Vol. XX, p. 247.

1907. *Phyllodromia nimbata* Shelford, Ann. Mag. Nat. Hist. (7), Vol. XIX, p. 31. [Kuching, Sarawak].

1 example, Kabayau, 600 feet, 9.5.1929.

Besides from Ceylon, known from all parts of Malaysia, except Java.

My assumption that *P. nimbata* Shelford is synonymous with this species, has been confirmed by undoubted examples of *ceylonica* from Ceylon which Mr. O. Henry, of the Colombo Museum, recently sent me. See my remarks in Bull., Raffles Museum, No. 1 (1928), p. 23, and especially in Ann. Mag. Nat. Hist. (10), Vol. VII (1931), p. 392.

Margattea crucifera Hanitsch. (Fig. 4).

1925. *Phyllodromia crucifera* Hanitsch, Sarawak Mus. J., Vol. III, p. 86. [♂ Mt. Murud; ♀ Mt. Dulit, Sarawak].

1 ♂ Pakka, 10,000 feet, 26.3.1929.

4 ♂♂ Lumu Lumu, 5,500 feet, March—April, 1929.

Fresh material enables me to give a revised description of this Blattid:

♂. Head exposed, dark testaceous to dull orange; inter-ocular distance 2/3 the width between antennal sockets; palps long, pale testaceous; antennæ fusco-testaceous. Pronotum sub-elliptical, posterior margin sub-truncate; disk testaceous, with a few symmetrical lines and dots; part behind the disk suffused fuscous. Tegmina exceeding the abdomen by fully 1/3 their length, pale testaceous, subhyaline; 18 costals, the distal ones springing by common roots; 8 longitudinal discoidal sectors; transverse venules of apex strongly marked, their centres thickened, causing a cruciform appearance. Wings hyaline, costal area slightly darker, veins testaceous; 15 costals, the 6 proximal ones simple, their ends thickened; the distal ones springing from common roots, ends not thickened; median vein simple; ulnar vein 5-ramose; apical triangle present, twice as long as broad. Supra-anal lamina, rhomboidal, posterior margin emarginate. Cerci long, testaceous. Subgenital lamina large, transverse, twice as broad as long, posterior margin straight. Styles symmetrical. Legs testaceous; front femora with 5 large spines, followed by a short series of about 9 piliform spines (type B).

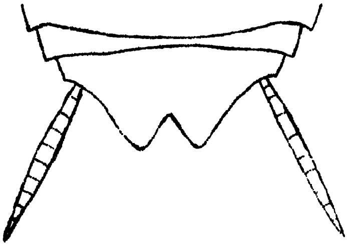

Fig. 4. *Margattea crucifera* Hanitsch ♂. End of abdomen from above. Enlarged.

♂. Total length 18 mm.; body 11.5 mm.; pronotum 3.2 × 4.2 mm.; tegmina 15 mm.

Margattea nebulosa Shelford.

1907. *Phyllodromia nebulosa* Shelf., Ann. Mag. Nat. Hist. (7). Vol. XIX, p. 32. [Kuching, Sarawak].

1 ♂ Kamborangah, 7,000 feet, 23.3.1929.

1 ♀ Marei Parei, 5,000 feet, 30.4.1929.

So far known from Borneo only. The type is in the Oxford Museum.

Pseudophyllodromia laticaput Brunner (Figs. 5, 6, 7).

1898. *Phyllodromia laticaput* Brunner, Abhandl. Senck. Ges., Vol. XXIV, p. 205, pl. XVI, fig. 8. [Brunei, Borneo; Baram River, Sarawak; Banguei I.].

1 ♂, 2 ♀ ♀ Kabayau, 600 feet, May 10th to 13th, 1929.

This species is closely allied to *Blatta laticeps* Walker, from Singapore (Cat. Blatt. B. M., Suppl., 1869, p. 142), the type (♀) of which is in the Oxford University Museum, but the two species can be distinguished readily by the markings of head, palps and pronotum. *P. laticeps* has the head uniformly brick-red, the palps entirely cream-white, and the pronotum with a broad whitish margin at the sides only. *P. laticaput* has the face variegated ("frons ferruginea, fusco-variegata"), the apical joint of the palps black, whilst the remainder is white, and the whitish lateral margins of the pronotum continued in front (antice et latere testaceo-marginato").[9] Besides the material from Kabayau I have here also 2 ♂ ♂ and 1 ♀ from Bettotan, near Sandakan, B. N. Borneo (C. Boden Kloss and H. M.

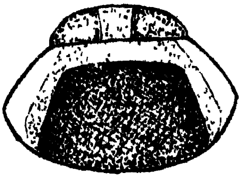

Fig. 5. *Pseudophyllodromia laticaput* Brunner ♀.
Head and pronotum. Enlarged.

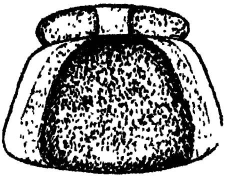

Fig. 6. *Pseudophyllodromia laticeps* Walker. Type ♀.
Head and pronotum. Enlarged.

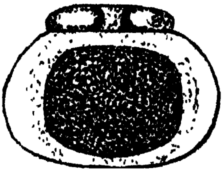

Fig. 7. *Pseudophyllodromia poiensis* sp. n. ♀.
Head and pronotum. Enlarged.

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[9] Occasionally there is also a narrow whitish margin behind.

Pendlebury, July—August, 1927) which beautifully show the variegated markings of the head.

Whether Brunner was acquainted with *laticeps* Walker, does not appear from his description of *laticaput*. Kirby (Synonymic Catalogue of the Orthoptera, Vol. I (1904), pp. 91 & 93) kept the two species apart, whilst Shelford regarded *laticaput* as synonymous with *laticeps* (Genera Insectorum, fasc. 73 (1908), p. 16, pl. I, fig. 8). The Oxford Museum possesses besides the type of *laticeps* from Singapore, two other ♀♀ specimens from the Botanic Gardens, Singapore (H. N. Ridley, 1906), also a ♂ from Selangor (H. C. Pratt, 1907), a ♂ from Batang Padang, Perak, 1,800 feet (H. M. Pendlebury, 31.5.1923) and a long series of 24 examples from Kuching, Sarawak, collected by Shelford. Finally I have before me two examples, ♂ and ♀, belonging to the Raffles Museum, taken by F. N. Chasen on Pulo Siantan, Anamba Islands, Sept., 1925.

But there are two or three other forms (species, subspecies, geographical races:) which differ both from *laticeps* and from *laticaput*. Four ♀♀ examples from the Mentawi Islands which in Bull. Raffles Museum, Vol. I (1928), p. 29, I took for *laticeps*, have the head uniform deep castaneous, the palps testaceous, with the apical joint black, and the pronotum with white margins at the sides only. This may be called **P. mentawiensis** sp. n. Further, in a collection from Mt. Poi, Sarawak, 4,500 feet—5,350 feet (E. Mjöberg, 1924), I find two ♀♀ examples which have the head reddish castaneous, with a distinct fulvous band across the forehead, the palps testaceous, with the apical joint black, the pronotum with the disk deep black, and white margins not only at the sides, but also in front and behind. This I call **P. poiensis** sp. n. (Fig. 7). Lastly in the same collection from Mt. Poi, 5,450 feet, I have a ♂ and a ♀, the general colour of which is much lighter; the head of the ♂ is dull orange, of the ♀ reddish castaneous, with the fulvous cross-band of the forehead less distinct in the two sexes; the palps are cream-white, with the apical joint black; the disk of the pronotum is castaneous, but lighter in the ♂ than in the ♀, and the whitish margins in front and behind are less sharply defined. For this form I propose the name **P. poiensis laeta** subsp. n.

Unfortunately I have at the present moment no access to Sumatran material, and it will be interesting to see whether the Blattid occurring there is *laticeps*, of the Malay Peninsula, or *mentawiensis*, of the Mentawi Islands.

The following table may serve to distinguish the various species of *Pseudophyllodromia* Brunner:

Palps with apical joint white: *P. laticeps* Walker. (Fig. 6).

Palps with apical joint black:

pronotum with white margin at the sides only: *P. mentawiensis* sp. n.

pronotum with white margins both at the sides and in front:

no white margin behind; head dull red, variegated with testaceous: *P. laticaput* Brunner (Fig. 5).

With white margin also behind; head reddish castaneous, with fulvous cross band; disk deep black: *P. poiensis* sp. n. (Fig. 7).

as *poiensis*, but general colour much lighter; cross band less distinct: *P. poiensis laeta* subsp. n.

Pseudophyllodromia pulcherrima Shelford.

1906. Trans. Ent. Soc., London, p. 266, pl. XVI, fig. 3. [♂, ♀ Kuching, Sarawak].

1 example, Kiau, 3,000 feet, 17.3.1929.

1 example, Kabayau, 600 feet, 13.5.1929.

This species seems to be restricted to Borneo, whilst the closely allied *sex-punctata* Hanitsch is known only from the Malay Peninsula and Penang. See J., M. B., R. A. S., Vol. I (1923), p. 418, fig. 15. Hebard (1929, p. 76) includes these two forms under his *Sundablatta*.

Liosilphoidea lata Hanitsch.

1923. *Liosilpha lata* Han., J., M. B., R. A. S., Vol. I, p. 416, fig. 14. [Sarawak; Malay Peninsula].

1931. *Liosilphoidea lata* Han., Résult. Scient. du Voyage aux Indes Orient. Néerl., Vol. IV, p. 48.

1 ♀ Kamborangah, 7,000 feet, 29.3.1929.

I re-described this species in the later publication, erecting for it and its allies the genus *Liosilphoidea*, and recorded it, besides from Borneo and the Malay Peninsula, also from Sumatra and New Guinea.

Chorisoblatta confluens Hanitsch.

1925. *Phyllodromia confluens* Hanitsch, Sarawak Mus. J., Vol. III, p. 85, fig. 6. [♀ Mt. Murud, Sarawak, 6,000 feet].

1 ♀ Lumu Lumu, 5,500 feet, 16.4.1929.

I have placed this species under *Chorisoblatta* Shelford, as defined by that author in Ent. Mo. Mag. (2), Vol. XXII (1911), pp. 154—6.

The single ♀ obtained bears an egg-case, with the suture carried upwards. The front femora which were missing in the type, are armed with 4 or 5 large spines, followed by a series of piliform spines (type B).

Ceratinoptera baluensis sp. n. (Figs. 8, 9, 10).

1 ♂ Lumu—Kamborangah, 5,500 feet—7,000 feet, 19.3.1929.

7 ♂♂, 9 ♀♀ Pakka, 10,000 feet, 20th—23rd March, 1929.

1 ♂ Kamborangah, 7,000 feet, 1.4.1929.

1 ♂ Marei Parei, 5,000 feet, 9.4.1929.

♂. Head slightly exposed; vertex fusco-castaneous, face somewhat lighter; interocular distance equal to that between antennal sockets; antennæ fusco-testaceous. Pronotum large, anterior margin parabolic, posterior margin very slightly rounded; disk fusco-castaneous, lateral margins broadly fulvo-testaceous. Tegmina about as long as

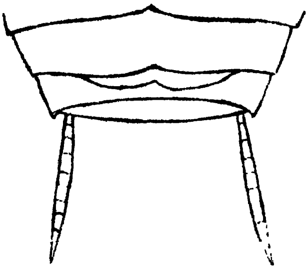

Fig. 8. *Ceratinoptera baluensis* sp. n. ♂. End of abdomen from above. Enlarged.

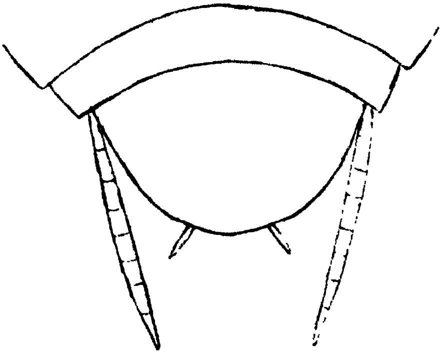

Fig. 9. *Ceratinoptera baluensis* sp. n. ♂. End of abdomen from below. Enlarged.

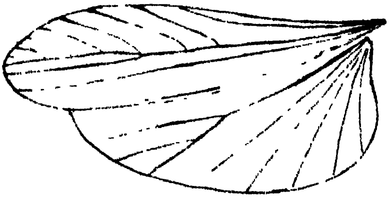

Fig. 10. *Ceratinoptera baluensis* sp. n. ♂. Left wing. Enlarged.

the body, apex rounded (not lanceolate); fulvo-testaceous, with irregular brownish blotches along its middle line; 10 costals; radial vein simple, 4 longitudinal discoidal sectors. Wings reduced, 2/3 the length of the tegmina pale fuscous, with apex yellowish; 7 costals, their ends slightly thickened; radial vein straight, beyond its middle giving off the median vein;[10] ulnar vein straight, simple; no apical triangle. Supra-anal lamina short, broad, posterior margin rounded, entire. Body below dark castaneous, with narrow lateral yellowish margins. Cerci dull testaceous. Sub-genital lamina (♂) very large, posterior margin rounded; styles symmetrical, stout. Legs testaceous; front femora with 2 stout spines, followed by a close series of piliform spines, (type B); hind legs very long, 15 mm.; tarsal arolia present.

The ♀ agrees with the ♂, except that the ventral yellow border is much reduced, or absent.

Total length: ♂ 8.5 mm.; ♀ 9 mm.

Closely allied to *Ceratinoptera (Allacta) microptera* Hanitsch, from Mt. Murud, top (Sarawak Mus. J., Vol. III (1925), p. 89. In this latter species, however, both tegmina and wings are still further reduced.

Ceratinoptera bipunctata[11] sp. n. (Fig. 11).

1 ♀ Kamborangah, 7,000 feet, 6.4.1929.

♀. Small, testaceous.—Head free, testaceous, a darker patch between the eyes; interocular distance ¾ the width between antennal sockets; antennæ fuscous. Pronotum with the anterior border parabolic, posterior border slightly rounded; testaceous, disk with a pair of black dots; posterior border fuscous suffused. Tegmina as long as the body, dark amber; 8 costals; radial vein simple; 3 (?) longitudinal discoidal sectors. Wings reduced, half as long as the tegmina; pale fuscous, apex yellowish suffused; 5

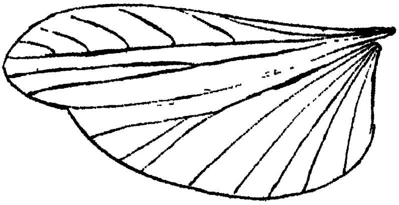

Fig. 11. *Ceratinoptera bipunctata* sp. n. ♀. Left wing. Enlarged.

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[10] Thus in the type; in the paratype the median vein branches off from the ulnar vein.

[11] from the markings of the pronotum.

costals; radial vein simple; median and ulnar veins springing from a common trunk, both simple; no apical triangle; 1st axillary 3-ramose from 2/3 of its course. Supra-anal lamina short, broad, entire. Legs testaceous; front femora armed after type B.

♀ Total length 8 mm.

Readily distinguished from the preceding species by the markings of the pronotum.—Apparently closely allied from *C. fulva* Brunner, from Java, the description of which, however, is so meagre that an exact comparison is impossible.

Dictyoblatta bimaculata Hanitsch.

1932. Annali Mus. Civ., Genoa, Vol. LVI, p. 67, figs. 9—11. [♂ Pahang; ♀ Mentawi I.]

1 ♀ Kabayau, 600 feet, 13.5.1929.

It is curious that examples of this rare Blattid have been found at such widely distant localities as Pahang, the Mentawi Islands and Borneo.

EPILAMPRINÆ.

Pseudophoraspis nebulosa Burmeister.

1838. *Epilampra nebulosa* Burm., Handb. Entom., Vol. II, p. 505. [Java].

1 ♀ Kiau, 3,000 feet, 9.4.1929.

Common throughout Malaysia.

Pseudophoraspis emarginata Hanitsch.

1923. J., M. B., R. Asiat. Soc., Vol. I, p. 424, figs. 16 & 17. [♂ Baram, Sarawak].

1 ♂ Kiau—Tenompok, 3,000 feet—4,700 feet, 18.3.1929.

1 ♂ Lobang, 4,000 feet, 4.4.1929.

1 ♂ Kiau, 3,000 feet, 11.4.1929.

5 ♂ ♂ Lumu-Lumu, 5,500 feet, 16 and 17.4.1919.

8 ♂ ♂ Kenokok, 3,300 feet, 26.4.1929.

1 ♂ Kabayau, 600 feet, 10.5.1929.

Only known from Borneo, and it is remarkable that all the examples so far taken are males. In the introduction I have made the perhaps somewhat risky suggestion that this Blattid represents the ♂ of *Rhicnoda natatrix* Shelford!

Pseudophoraspis testudinaria Hanitsch.

1925. Sarawak Mus. J., Vol. III, p. 91. [♀ Sarawak].

2 ♀ ♀ Tenompok Pass, 4,500 feet—4,700 feet, 18.3.1929.

1 ♀ Lumu-Lumu to Kamborangah, 7,000 feet, 20.3.1929.

Not known from outside Borneo.

Pseudophoraspis lacrimans[12] sp. n. (Fig. 12).

1 ♂ Kiau, 3,000 feet, 17.4.1929.

♂ Head covered, fulvo-testaceous; with three longitudinal castaneous lines starting from the occiput and continuing across the vertex to the upper part of the face, between them a reticulated mass of thin brown lines; a large urn-shaped castaneous blotch on the face; inter-ocular distance equal to 2/3 the width between antennal sockets; palps testaceous, terminal joint light brown; antennæ testaceous, turning to fuscous apically. Pronotum broad, anterior margin parabolic, posterior margin obtusely angled; reddish castaneous, disk with indistinct darker and lighter markings; lateral margins broad, with scattered larger and smaller pale yellowish spots. Tegmina broad, exceeding the abdomen by 1/6 their length, apex rounded; reddish castaneous, shining, with scattered larger and smaller lighter spots, similar to those of the pronotum. Wings fully developed, deep reddish castaneous. Supra-anal lamina emarginate. Cerci blackish above, ferruginous below. Body below dark testaceous, irregularly suffused with reddish-castaneous and black, each sternite with a pair of sub-marginal black spots. Sub-genital lamina (♂) twice as broad as long, posterior margin produced, rounded, entire. Styles large, flattened. Coxæ and femora olive-brown, tibiæ and tarsi dull testaceous; posterior tibiæ 3-seriately spined on outer aspect; posterior metatarsus nearly as long as the remaining joints together, entirely spined; 1st and 2nd tarsal joints with a few scattered spines, 3rd joint unarmed; claws symmetrical; arolia large.

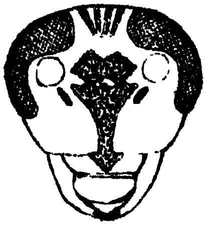

Fig. 12. *Pseudophoraspis lacrimans* sp. n. ♂. Face. Enlarged.

♂. Total length 50 mm.; body 44 mm.; pronotum 12 × 17.5 mm.; tegmina 40 mm.

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[12] from the tear-like markings on the tegmina.

Its nearest ally would seem *Pseudophoraspis* (*Epilampra*) *miranda* Shelford, from Mt. Penrissen, Sarawak, which is, however, considerably paler in colour and has the pronotum deeply and coarsely punctured.

Pseudophoraspis uniformis sp. n.

1 ♀ Tenompok Pass, 4,500 feet, 18.3.1929.

♀. Large, broad, almost uniform castaneous.—Head covered, dark testaceous; vertex with 4 broad dark lines which on the face join to form a large urn-shaped castaneous macula; inter-ocular distance 2/3 the width between antennal sockets; basal joints of palps transparent testaceous, terminal joint opaque; antennæ ferruginous, darker distally. Pronotum broad, anterior border parabolic, posterior border obtusely angled; reddish castaneous, with indistinct lighter spots; disk with a pair of transverse depressions in front, and a pair of smaller, round pits close behind. Tegmina, broad slightly exceeding the abdomen, apex rounded, castaneous, with very sparse lighter spots. Wings fully developed, reddish castaneous. Supra-anal lamina emarginate. Cerci blackish above, ferruginous below. Body below ferruginous, each sternite with a pair of sub-marginal black spots. Coxæ and femora pale olive-brown, tibiæ and tarsi reddish testaceous; posterior tibiæ 3-seriately spined on outer aspect; posterior metatarsus as long as the remaining joints together, entirely spined; 1st, 2nd and 3rd tarsal joints with a few scattered spines each; claws symmetrical; arolia large.

♀. Total length 40 mm.; body 36 mm.; pronotum 9 × 14 mm.; tegmina 32 mm.

Closely allied to the previous species, *P. lacrimans* differing from it by its smaller size and the practically uniform colouring of pronotum and tegmina. It may even prove to be the ♀ of that species!

Rhabdoblatta procera Brunner.

1865. *Epilampra procera* Brunner, Nouv. Syst. Blatt., p. 192. [Java].

1 ♂ Kiau, 3,000 feet. At light. 6.4.1929.

1 ♂ Kamborangah, 7,000 feet, 6.4.1929.

3 ♂♂, 1 ♀ Marei Parei, 5,000 feet, 28.4.1929.

Widely distributed throughout the Malaysian subregion. I recently also recorded it from Celebes (Résultats Scientifiques du Voyage aux Indes Orientales Néerlandaises, Vol. IV (1931), p. 51).

Stictolampra lurida Burmeister.

1838. *Epilampra lurida* Burm., Handb. Entom., Vol. II, p. 505. [Java].

6 ♂ ♂ Kiau, 3,000, April, 1929.

1 ♂ Kenokok, 3,300 feet, 26.4.1929.

1 ♀ Koung, 1,300 feet, 5.5.1929.

1 ♂ Koung—Kabayau, 1,000 feet—600 feet, 6.5.1929.

3 ♂ ♂, 2 ♀ ♀ Kabayau, 600 feet, May, 1929.

Distribution: India, the whole of Malaysia and Celebes.

I recently proposed *Stictolampra* n.g. for those species formerly included under *Epilampra* Burmeister, in which the pronotum is punctured, retaining *Epilampra* for those in which the pronotum is smooth (Résultats Scient. du Voyage aux Indes Orientales Néerlandaises, Vol. IV (1931), p. 51).

Epilampra albina Saussure.

1895. *Hedaïa albina* Sauss., Rev. Suisse Zool., Vol. III, p. 351. [Java].

1 example, Kiau, 3,000 feet, 6.4.1929.

1 example, Kamborangah, 7,000 feet, 6.4.1929.

First described from Java, and recently also recorded by myself from Bencoolen, Sumatra. (Stettin. Entom. Zeit., Vol. XCI (1930), p. 188). This is therefore the first record from Borneo, but I have also seen a ♀ example from Gunong Tahan, Pahang, 5,500 feet (C. Boden Kloss, July, 1923).

Epilampra communis Hanitsch.

1928. Bull. Raffles Museum, Singapore, No. 1, p. 32. [Mentawi Is.].

3 ♂ ♂ Kiau, 3,000 feet. At light. March and April, 1929.

First described by myself in enormous numbers from the Mentawi Islands. I have since seen a ♀, from Engano, taken by E. Modigliani in May, 1894, and a few examples from the Malay Peninsula in the F. M. S. Museums collection. The present is the first record from Borneo.

Epilampra pendleburyi sp. n.

1 ♂ Kiau, 3,000 feet. At light. 31.3.1929.

1 ♂ Kiau, 3,000 feet, 3.5.1929.

1 ♀ Kiau, 3,000 feet. At light. 3.4.1929.

♂. Head free, testaceous; occiput with 4 divergent streams of castaneous dots, the two middle ones being continued across the vertex; face with a large black urn-shaped blotch; labrum fulvo-testaceous; palps fusco-testaceous; inter-ocular distance fully ½ of the width between antennal sockets; antennæ fuscous. Pronotum small, sub-elliptical, posterior margin strongly produced; disk with

3 pairs of symmetrically arranged black blotches, between them numerous pale tear-shaped dark-margined maculæ; margin all round with several more or less regular rows of medium-sized ferruginous spots. Tegmina exceeding the abdomen by fully ¼ their length, with masses of irregular castaneous blotches of different sizes, producing a dead-leaf-like appearance. Wings fully developed, dark testaceous, costal margin with ferruginous blotches. Supra-anal lamina emarginate. Cerci fusco-testaceous. Abdomen below testaceous, finely sprinkled castaneous; each segment with a pair of large sharply-defined black maculæ; a diffused dark streak in the middle line. Sub-genital lamina oval, twice as broad as long; styles symmetrical, on either side. Legs with the coxæ olive-brown, remainder fusco-testaceous; posterior metatarsus equal in length to the remaining joints together, entirely spined; tarsal joints each with a pair of small spines; pulvilli terminal; claws symmetrical; arolia present.

♀. Similar to the ♂, except that the underside of the abdomen is considerably darker.

	♂	♀
Total length	39 mm.	45 mm.
body	30 „	32 „
pronotum	8 × 9.2 „	9.5 × 11.5 „
tegmina	32 „	38 „

Closely allied to *Epilampra modiglianii* Hanitsch, from Sumatra,[13] but having an urn-shaped design on the face, instead of a broad vertical stripe. The markings of the face are fairly constant, whilst those of pronotum and tegmina are almost impossible to describe in species of *Epilampra* of a dead leaf-like appearance.

Epilampra demergens sp. n. (Figs. 13, 14, 15, 16).

12 ♂♂ immature, 6 ♀♀ immature, Kamborangah, 7,000 feet, 27.3.1929 to 5.4.1929.

♂. Immature, apterous.—Head exposed, castaneous, labrum somewhat lighter; basal joints of palps light castaneous, apical joint nearly black; interocular distance fully equal to width between antennal sockets; antennæ fusco-castaneous. Pronotum with the anterior margin parabolic, posterior margin only slightly angled; fusco-castaneous. Mesonotum and metanotum with the lateral angles strongly produced backwards. Metanotum and abdominal tergites each with a row of blunt tubercles along their posterior margin. Supra-anal lamina produced, rounded, posterior margin entire. Cerci stout, pointed, dull testaceous. Last pair of spiracular tubes situated to the outside of the cerci. Abdominal sternites with only few tubercles. Sub-genital lamina broader than long, posterior margin rounded, entire. Styles symmetrical. Legs dull testaceous; posterior metatarsus rather longer than the remaining joints together, entirely spined; tarsal joints with very few spines each; tarsal claws symmetrical.

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[13] Annali Mus. Civ., Genoa, Vol. LVI (1932), p. 70, fig. 12.

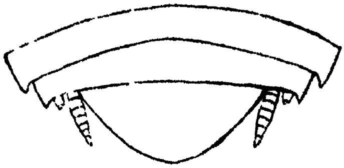

Fig. 13. *Epilampra demergens* sp. n. ♂ immature. End of abdomen from above. Enlarged.

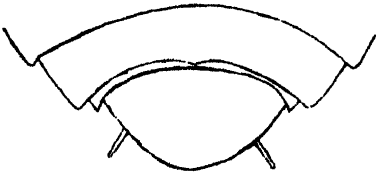

Fig. 14. *Epilampra demergens* sp. n. ♂ immature. End of abdomen from below. Enlarged.

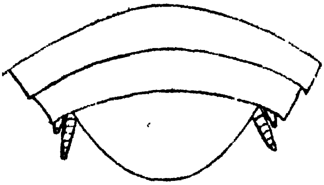

Fig. 15. *Epilampra demergens* sp. n. ♀ immature. End of abdomen from above. Enlarged.

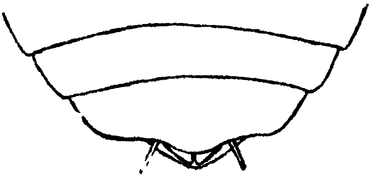

Fig. 16. *Epilampra demergens* sp. n. ♀ immature. End of abdomen from below. Enlarged.

♂. 11 mm. to 16 mm. in total length.

♀. Similar to the ♂, also immature, 13 to 17 mm. in length. The interpretation of the last ventral segments of the abdomen in the three youngest specimens, measuring 13 mm., offers unusual difficulty. If fig. 14 represents the sub-genital plate of the ♂, then we have to regard the corresponding plate shown in fig. 16 as that of the ♀. Projecting beyond it and lying dorsal to it, is a small divided plate, with distinct styles on either side, showing a startling similarity to the arrangement which I described and figured in the case of an immature ♂ of *Miopanesthia* sp., though to my knowledge styles in the sub-family Panesthinæ had never yet been observed (Annali Mus. Civ., Genoa, Vol. LVI (1932), p. 90, fig. 21). No styles are present in the older ♀ larvæ.

This Blattid, though having a superficial likeness to *Rhicnoda natatrix* Shelford, can readily be distinguished from that species by its head being exposed and by the posterior margin of the supra-anal lamina being entire, not emarginate. Three of the ♂ ♂ were labelled "aquatic."[14] This cockroach is probably closely allied to *Epilampra annandalei* Shelford, which Dr. Annandale had discovered in certain mountain streams in India. (Records, Indian Museum, Vol. III (1909), pp. 125—7).

Rhicnoda natatrix Shelford (Figs. 17, 18, 19, 20).

1907. The Zoologist, p. 226, figs. 1—3; 1910. Genera Insectorum, fasc. 101, p. 9, pl. II, fig. 1 [♀ Borneo].

2 ♂ ♂, entirely apterous, Lumu Lumu, 5,500 feet, 6 and 15.4.1929.

1 ♂ entirely apterous, Kamborangah, 7,000 feet, 20.3.1929.

1 ♀ with scale-like tegmina, Lumu Lumu—Kamborangah, 5,500 feet—7,000 feet, 20.3.1929.

3 ♀ ♀ with scale-like tegmina, Kamborangah, 7,000 feet, 20.3.1929.

3. ♀ ♀ with scale-like tegmina, Lumu Lumu, 5,500 feet, 7, 11 and 15.4.1929.

1 ♀ with scale-like tegmina, Kenokok, 3,300 feet, 24.4.1929.

1 ♀ entirely apterous, Lumu Lumu—Kamborangah, 5,000 feet—7,000 feet, 20.3.1929.

3 ♀ ♀ entirely apterous, Lumu Lumu, 5,500 feet, 7, 8 and 15.4.1929.

1 ♀ entirely apterous, Kenokok, 3,300 feet, 22.4.1929.

In the "Zoologist" for June, 1907 Shelford tells of certain immature cockroaches, measuring 10 to 25 mm., which he had taken in a mountain stream close to Kuching, Sarawak, and in the same paper he describes as the type a very much larger specimen, ♀, measuring 35.5 mm., with scale-like tegmina which he had found in the Oxford Museum, bearing the label "Borneo, Wilson Saunders collection, 1830—1873." There is therefore no indication on the label that the type was actually taken in water, and the

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[14] See foot note [15] under *R. natatrix* Shelf.; the two species were taken under similar circumstances. H. M. P.

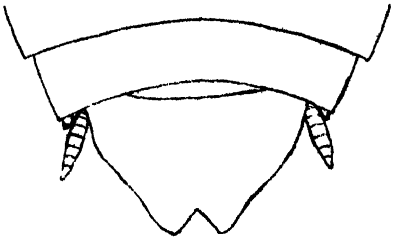

Fig. 17. *Rhicnoda natatrix* Shelf. type ♀. End of abdomen from above. Enlarged.

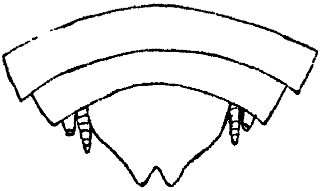

Fig. 18. *Rhicnoda natatrix* Shelf. ♂ immature (total length 13 mm.) End of abdomen from above. Enlarged.

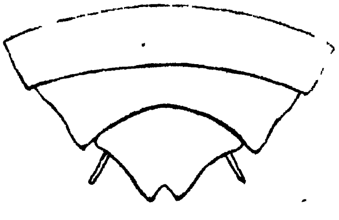

Fig. 19. *Rhicnoda natatrix* Shelf. ♂ immature (total length 13 mm.) End of abdomen from below. Enlarged.

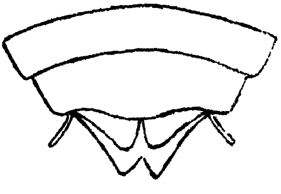

Fig. 20. *Rhicnoda natatrix* Shelf. ♀ immature (total length 16.5 mm.) End of abdomen from below. Enlarged.

Museum unfortunately contains none of the specimens which Shelford had captured in that mountain stream.

In the present collection from Kinabalu there are numbers of a cockroach which represent, without any doubt, the younger stages of *natatrix*. Whether they were taken on land or in water, the labels do not indicate.[15] The few ♂ ♂, measuring only 15 mm. in length, are entirely apterous, whilst the much more numerous ♀ ♀ include both apterous stages, 16 mm. to 27 mm. in length, and stages, 27 mm. in length, with scale-like tegmina, just as the type. Though these specimens are therefore all smaller than the type, I have recently been able to examine a ♀ from the Stockholm Museum, taken by Mjöberg near the Bajau River, E. Borneo. It is exactly as large as the type and resembles it in all other particulars. The full-grown ♂ is unfortunately unknown, though Annandale observed ♂ aquatic cockroaches in Kelantan, Malay Peninsula. His graphic description deserves quoting: "In the river the wingless females sit on floating logs, in the crevices of which they deposit their egg-capsules, just above the water-line, and dive upon the least disturbance, remaining under water for some minutes, and sneaking to the surface again beneath the shelter of the log. They do not appear to take down much air with them, as no part of the body looks silvery under water. I have occasionally seen the winged males rising from the surface of the river and taking flight, but I was never able to detect them actually in the water. The jungle specimens were all females; they were taken either in the water or among the matted roots with which the sides of the stream were covered." ("The Entomologist's Record," 1900, p. 76). Shelford, referring to these observations, remarks: "Unfortunately, Dr. Annandale's specimens appear to be lost, so that they cannot be identified with certainty."

Whether *Pseudophoraspis emarginata* Hanitsch, is the adult ♂ of *R. natatrix* Shelford, as suggested in the Introduction, is a question which is almost hopeless to settle from dried Museum specimens, and I recommend this matter to the attention of Entomologists living in the East. It has also yet to be decided as to whether the Blattid which Brunner doubtfully describes and figures as the ♂ of his *Rhicnoda rugosa* ♀, is this in fact, or not. (Annali Mus. Civ., Genoa (2) Vol. XIII (1892—3) p. 31, pl. I, figs. 11a and b)

[15] Those specimens bearing Kamborangah labels were discovered under stones in the bed of the Kadamaian River at the bottom of the gorge below our camp, (see *antea*, p. 26). The actual habitat of these insects was between 3,000—4,000 feet. They moved actively through the water when disturbed. The others were found in damp situations at no distance from water. H. M. P.

Closely allied to these forms is probably *Cyrtonota lata* Hanitsch, ♀, from W. Sumatra, which shows a striking resemblance to *R. natatrix,* except that its tegmina are fully developed, or almost so, reaching to the posterior margin of the sixth abdominal segment. The ♂ is unknown. (Tijdschr. Entom., Vol. LXXII (1929), p. 282, fig. 2.)

The most remarkable point about this cockroach is that the smallest ♀, from Lumu Lumu, 5,500 feet, measuring 16.5 mm. in length, bears styles, just as the youngest of the ♀ *Epilampra demergens* described above. These styles lie on either side of a divided plate which projects beyond the sub-genital lamina, and projecting again and lying above it is seen the supra-anal lamina which is here emarginate, whilst it is entire in *E. demergens* (compare figs. 16 and 20).

BLATTINÆ.

Dorylæa flavicincta de Haan.

1842. *Blatta flavicincta* de Haan, Temminck, Verhand. Orth., p. 50. [Java].

1 ♀ Lobang, 4,000 feet, 5.4.1929.

Distribution: Malaysia, Formosa, Madagascar.

Blatta concinna de Haan.

1842. Temminck, Verhand. Orth., p. 50 [Java].

1 ♀, Kiau, 3,000 feet, 4.4.1929.

Distribution: India, Malaysia, Hongkong, Japan, Australia.

Periplaneta montana Hanitsch.

1923. J., M. B., R. Asiat. Soc., Vol. I, p. 140, figs. 25 and 26. [Gunong Kledang, Perak].

1 ♂. Kiau, 3,000 feet, 9.4.1929.

This is the first record from Borneo. Hitherto known only from the Malay Peninsula, Sumatra and Mentawi Is.

Periplaneta succinea Hanitsch.

1925. Sarawak Mus. J., Vol. III, p. 96, fig. 10. [Mt. Dulit and Mt. Murud, Sarawak].

1 ♂ Lumu Lumu, 3,500 feet, 7.4.1929.

So far recorded from Borneo only, but I have before me also a ♂ from Cameron Highlands, Pahang, 4,800 feet (M. R. Henderson, 26.1.1924).

Periplaneta australasiæ Fabr.

1775. *Blatta australasiae* Fabr., Syst. Entom., p. 271.

3 specimens. Kiau, 3,000 feet, 16.4.1929.

1 specimen. Kenokok, 3,300 feet, 25.4.1929.

Periplaneta blattoides sp. n. (Fig. 21).

1 ♂. Lumu Lumu, 5,500 feet, 15.4.1929.

♂. Almost uniformly light castaneous. Tegmina hardly exceeding the abdomen.—Head free, vertex slightly darker than the face; interocular distance 4/5 of the width between the antennal sockets; antennæ much exceeding the body. Pronotum with the anterior margin parabolic, posterior margin gently rounded. Tegmina broad, as long as the abdomen, or barely exceeding it. Wings fully developed. Supra-anal lamina sub-quadrate, posterior margin shallow emarginate. Cerci stout, under surface dark castaneous. Body below dark castaneous. Sub-genital lamina transverse, hardly 1/3 as long as broad, posterior margin entire. Styles large, stout, pilose. A heavy unciform spine arising just above the left style, curving to the right and upwards. Legs reddish-testaceous; posterior metatarsus in length exceeding the remaining joints together, entirely spined; 1st and 2nd tarsal joints also spined along their whole length [3rd tarsal joint and claws missing].

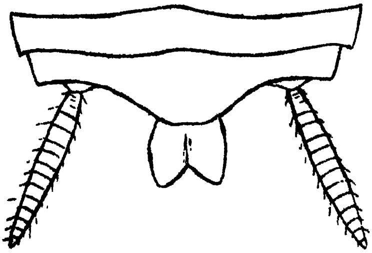

Fig. 21. *Periplaneta blattoides* sp. n. ♂. End of abdomen from above. Enlarged.

♂. Total length 20.5 mm.; body 19.5 mm.; pronotum 6 × 7.8 mm.; tegmina 15 mm.

The shortness of the tegmina brings this species to the border line between *Blatta* and *Periplaneta.*

Catara rugosicollis Brunner.

1865. *Deropeltis rugosicollis* Br., Nouv. Syst. Blatt., p. 245. [Java ?].

5 ♂ ♂, 10 ♀ ♀; Kiau 3,000 feet; Lumu Lumu 5,500; Marei Parei 5,000 feet; Kamborangah 7,000 feet; April, 1929.

Distribution: the whole of Malaysia.

PANCHLORINÆ.

Pycnoscelus striatus Kirby.

1903. *Leucophaea striata* Kirby, Ann. Mag. Nat. Hist., (7), Vol. XII, p. 378. [Batu Caves, Selangor].

3 ♂ ♂ Lumu Lumu, 5,500 feet, April, 1929.

Kirby's description may be amplified as follows:

♂. Head freely exposed; vertex reddish, face castaneous, basal joints of palps testaceous, terminal joint castaneous; interocular distance nearly equal to width between antennal sockets; antennæ fuscous. Pronotum broader than long, sub-elliptical, posterior margin strongly angled; castaneous, anterior margin yellowish suffused; with scattered punctures. Tegmina exceeding the abdomen by ¼ their length, light castaneous, tips paler. Wings with the anterior portion fusco-castaneous, costal area bright ferruginous, posterior portion fuscous. Body above olive brown. Supra-anal lamina transverse, oval. Cerci moderately long, reddish testaceous. Body below testaceous, with golden sheen, darker behind, each segment with a pair of submarginal stigmata. Sub-genital lamina short, 3 or 4 times broader than long. No styles. Legs testaceous, spines castaneous.

♂. Total length 27 mm.; body 21 mm.; pronotum 5 × 7 mm.; tegmina 22 mm.

Its larger size, and the more or less uniform castaneous colour readily distinguish this species from *P. surinamensis* L. and *P. nigra* Brunner.

CORYDINÆ.

Homopteroidea nigra Shelford.

1906. Trans. Ent. Soc., p. 274, pl. XVI, figs. 13 and 14. [Sarawak; Sumatra].

2 examples, Tenompok Pass, 4,700 feet, 18.3.1929.

1 example, Kamborangah, 7,000 feet, 3.4.1929.

1 example, Lumu Lumu, 5,500 feet, 16.4.1929.

Also occurring on the Malay Peninsula (Batang Padang, Perak, 1,800 feet, H. M. Pendlebury, 31.5.1923).

Homopteroidea shelfordi Hanitsch.

1925. Sarawak Mus. J., Vol. III, p. 99, fig. 12. [Mt. Murud and Mt. Dulit, Sarawak].

1929. Tijdschr. voor Entom., Vol. LXXII, p. 295, fig. 6. [Sumatra].

7 examples: Tenompok Pass, 4,700 feet, 18.3.1929; Kamborangah, 7,000 feet, 3.4.1929; Lumu Lumu 5,500 feet, 16.4.1929.

Distribution: Borneo, Sumatra, Malay Peninsula.

Homopteroidea minor sp. n. ?

1 ♂, 1 ♀ Kenokok, 3,300 feet, 22.4.1929.

The two specimens quite agree in colouring and structure with *H. nigra* Shelford, but measure only 5 mm. in total length, as against 7 mm. of the type of *nigra*. In the absence of more material I must leave it uncertain as to whether or not they represent a new species.

Ctenoneura fulva Hanitsch.

1925. Sarawak Mus. J., Vol. III, p. 101, figs. 13 and 14.
[♂ and ♀ Sarawak].

14 examples: Kamborangah, 7,000 feet, March, 1929; Lumu Lumu, 5,500 feet, April 1929; Kenokok, 3,300 feet, April, 1929.

Not known from outside Borneo.—In Tijdschr. voor Entom., Vol. LXXII (1929), pp. 292—4, I gave the differences between this and the allied species, with their distribution, viz. *C. major*, from Sarawak and Annam, *C. brunnea*, from Sumatra, and *C. aberrans*, from the Mentawi Is.

By an oversight in the original description, p. 101, I spoke of 4 discoidal sectors in the tegmina, where "anals" were meant.

OXYHALOINÆ.

Chorisoneura lativitrea Walker.

1868. *Blatta lativitrea* Wlk., Cat. Blatt. B. M., p. 223.
[Cambodia ♀].

1 example. Kiau, 3,000 feet. At light. 27.3.1929.

Distribution: Cambodia, Malay Peninsula, Sumatra, Borneo, New Caledonia. (See Tijdschr. Entom., Vol. LXXII (1929), p. 299).

PERISPHÆRINÆ.

Paranauphœta lyrata Burmeister.

1838. *Nauphoeta lyrata* Burm., Handb. Entom., Vol. II, p. 508.
[Java].

1 example, Kiau, 3,000 feet, 16.4.1929.

1 example, Kenokok, 3,300 feet, 25.4.1929.

Distribution: India, Malaysia, Philippines, Celebes.

Perisphæria armadillo Serville.

1831. Ann. Sci. Nat., Vol. XXII, p. 44.
1839. Ins. Orth., p. 133, pl. III, fig. 2. [♀ Java].

1 ♂ Kamborangah, 7,000 feet, 27.3.1929.

1 ♂ Lumu Lumu, 5,500 feet, 7.4.1929.

1 ♂ Kabayau, 600 feet, 9.5.1929.

1 ♀ Kamborangah, 7,000 feet, 2.4.1929.

3 ♀ ♀ Lumu Lumu, 5,500 feet, 11 to 17.4.1929.

I have little doubt that my identification of the 4 ♀ ♀ is correct. It is a well-known species and has been recorded from all parts of the Malay Archipelago up to New Guinea (see "Annali Mus. Civ., Genoa, Vol. LVI (1932), p. 35). But I feel less confident with regard to the three ♂ ♂ which I include under this species, and I am afraid that no definite identification will be possible until specimens are taken "in cop." The three ♂ ♂ differ from each other in total length, in the proportion of the length of the tegmina and wings to that of the body, and in colouring, as follows:

	Total length	Body	Tegmina	Underside & legs
♂ Kamborangah, 7,000 ft.	26 mm.	19 mm.	22 mm.	dark testaceous
♂ Lumu Lumu, 5,500 ft.	23 „	17 „	18 „	light castaneous
♂ Kabayau, 600 ft.	18 „	16 „	15 „	dark castaneous

It would be interesting if it could be shown that the size and the colouring of the male depended upon the altitude.

Perisphæria rubescens sp. n.

4 ♂ ♂, immature, Kamborangah, 7,000 feet, March 28th to April 4th, 1929.

1 ♀ Kinabalu, 7,000 feet—8,500 feet, 20.3.1929.

1 ♀ Kamborangah, 7,000 feet, 4.4.1929.

2 ♀ ♀ Lumu Lumu, 5,500 feet, 7—9.4.1929.

♀. Apterous. Head covered, reddish mahogany-brown, palps reddish-testaceous; frons punctured; interocular distance ¼ to ⅓ of the width between antennal sockets; antennæ purplish black. Pronotum with the anterior margin parabolic, slightly inverted, posterior margin sub-truncate; with few minute punctures; deep claret colour to black. Mesonotum and metanotum with the posterior margins slightly concave; shining black; punctures more numerous. Abdominal tergites without sulcus, coarsely punctured, black. Supra-anal lamina 2/3 as long as broad, posterior margin rounded, entire; cerci short, bulbous, ferruginous. Body below shining black, coarsely punctured; sternites with slight sulci; each of them, and sub-genital lamina, on either side with 3 sub-marginal pits. Legs mahogany-brown, with metatarsi and tarsi dark testaceous; arolia present.

♀. Total length 15 mm.

The collection unfortunately contains no mature males which, no doubt, would be fully winged like the other species of *Perisphaeria* and *Pseudoglomeris.* These immature males bear a striking resemblance to the full-grown females, but can at once be distinguished by the lateral lobes of the mesonotum and metanotum which are enormous and produced backwards. The sub-genital lamina is very small, lenticular in shape, with posterior margin entire; it is symmetrical in shape, whilst the same lamina in other species of Perisphærinæ usually shows a distinct emargination on the right side. The styles are minute, placed on either side of the lamina and closely applied to it so that they are easily overlooked. These four immature males measure 7 mm. to 13 mm. in length.

Pseudoglomeris flavicornis Burmeister.

1838. *Perisphaeria flavicornis* Burm., Handb. Ent. Vol. II, p. 488. [Java].

1 ♀ Lumu Lumu, 5,500 feet, 5.4.1929.

Distribution: India, Assam, Tenasserim, Cambodia, Malay Peninsula, Java, Borneo. Not yet recorded from Sumatra. (See Stettin. Entom. Zeit., Vol. XCI (1930), p. 192).

Glyptopeltis wallacei sp. n.

1 ♂ Kiau, 3,000 feet, 23.3.1929.

[1 ♂ Amboina, collected by Wallace, 1857—1860; in Hope Dept., University Museum, Oxford].

♂. Small, narrow, rod-like.—Head freely exposed, reddish, mouth parts testaceous; eyes far apart, interocular distance at least 2/3 of width between antennal sockets; ocelli large, cream-white; antennæ (mutilated) dark fuscous. Pronotum with the anterior and lateral margins rounded in a semi-circle, posterior margin gently curved; rufo-castaneous, finely and closely punctured; disk slightly rugose. Tegmina long, narrow, exceeding the abdomen by nearly 1/3 their length, base rufo-castaneous, turning to dull fulvous apically, veins strongly raised. Wings fully developed, fuscous. Abdomen above dull testaceous to light brown; all segments with sulci; supra-anal lamina three times broader than long, posterior border rounded, entire. Cerci light brown. Abdomen below yellowish brown, only the last sternite with distinct sulcus; each sternite with a pair of sub-marginal black stigmata. Sub-genital lamina sub-triangular, asymmetrical, emarginate on the right; no styles. Legs dull testaceous.

♂. Total length, 15 mm.; body, 12 mm.; pronotum 3 × 3.5 mm.; tegmina, 12 mm.

♀. Unknown.

I have placed this species under *Glyptopeltis* Saussure[16] on account of its eyes being far apart, but regard the absence of any metallic colour as of little generic significance. The other known species are *G. biguttata* Sauss., and *G. couloniana* Sauss., the former from Java, the latter only doubtfully recorded from there.

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[16] Mém. Soc. Genève, Vol. XXIII (1872), p. 119.

PANESTHINÆ.

Salganea morio Burmeister.

1838. *Panesthia morio* Burm., Handb. Entom., Vol. II, p. 513. [Java].

1 ♂ Kenokok, 3,300 feet, 25.4.1929.

1 ♂ Kabayau, 600 feet, 9.5.1929.

Distribution: the whole of Malaysia; also recorded from Ceylon and Amboina.

The ♂ from Kenokok (tegmina and wings mutilated, as is so frequently the case) measures: total length, 47 mm.; pronotum, 11.5 × 18 mm.—The left anterior femur bears one spine, the right two.

Salganea inæqualiter-spinosa sp. n. (Fig. 22).

1 ♂ Kiau—Tenompok, 3,000 feet—4,700 feet, 19.3.1929.

16 ♂♂, 26 ♀♀ Lumu Lumu, 5,500 feet, 9.4.1929.

♂. Small, black.—Head exposed, shining black, labrum and mouth parts deep orange; closely punctured; interocular distance nearly equal to width between antennal sockets; antennæ fuscous, tips ferruginous. Pronotum subelliptical, posterior margin truncate; centre deeply depressed, bounded at the sides and behind by a triangular swelling; deeply castaneous to black, closely punctured. Tegmina exceeding the abdomen by 1/5 of their length, deep black, veins standing out in longitudinal ridges. Wings fully developed, black. Abdomen above black, deeply punctured; lateral margins of 7th tergite with two teeth each, posterior angle drawn out into a spine. Supra-anal lamina with a varying number, generally 11 to 13, of sharp-pointed comb-like teeth of unequal size, and a much larger tooth

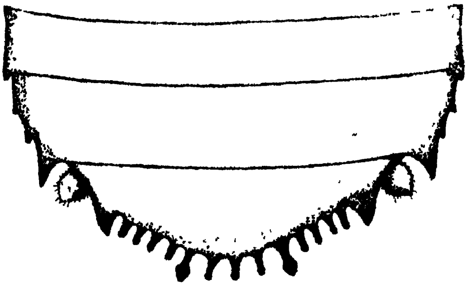

Fig. 22. *Salganea inaequaliter-spinosa* sp. n. End of abdomen from above. Enlarged.

on either side. Cerci bulbous, pilose, brownish. Abdomen below deep castaneous to black. Legs rufous; front femora not armed.

♂. Total length, 24.5 mm.; body, 19.5 mm.; pronotum 3.5 × 5.8 mm.; tegmina, 20 mm.

♀. Fully winged like the ♂, and of the same dimensions.

Of the 17 ♂♂ examples of this collection 7 are mature. However, only two of them have tegmina and wings in perfect condition; in the others they are worn away to short stumps, as is so often the case with Panesthinæ. Of the 26 ♀♀ examples 11 are mature, but here again only two have tegmina and wings perfect. The immature specimens, besides being apterous, are somewhat lighter in colour, the youngest ♀♀ being ferruginous.

No other species of *Salganea* or *Panesthia* shows such strongly developed spines on the supra-anal lamina. Excluding the two heavy teeth on either side, they are always of two sizes. viz. 8 to 10 small spines intermixed with 2 or 3 larger ones. The specimen figured shows a lamina with symmetrically arranged spines, but an asymmetrical arrangement is quite as common.—The one ♂ from Kiau—Tenompok has the left lateral heavy tooth transformed into a plate.

I have before me also several specimens from Sarawak, viz. one ♂ each from Mt. Poi, 4,350 feet, and Mt. Penrissen, 4,500 feet, and 1 ♂, 3 ♀♀ Mt. Tibang, 1,400 metres collected by Dr. E. Mjöberg in 1924.

Panesthia javanica Serville.

1831. Ann. Sci. Nat., Vol. XXII, p. 38. [Java].
1839. Ins. Orth., p. 131, pl. II, fig. 5.

1 ♂ immature, Kamborangah, 7,000 feet, 7.4.1929.

1 ♂, 1 ♀ immature, Lumu Lumu, 5,500 feet, 17.4.1929.

4 ♂♂, 1 ♀ Kiau, 3,000 feet. April, 1929.

4 ♂♂, 1 ♂ immature, 4 ♀♀, Kabayau, 600 feet, May, 1929.

Distribution: Malaysia, Burma, Cambodia, Lower Siam, Philippines.

The ♂♂ of this collection are decidedly darker in colour than the ♀♀, viz. practically black, whilst most of the ♀♀ are dark castaneous. Only a ♀ from Kabayau has the dark colouring of the ♂♂.—Another point of interest is: the immature specimens, 1 ♂ and 3 ♀♀, from the low country, for instance Kabayau, 600 feet, have the normal orange maculæ, that is to say one pair each on mesonotum and metanotum. The two immature ♂♂, one from Lumu Lumu, 5,500 feet and the other from Kamborangah, 7,000 feet, have orange maculæ on the metanotum only. (The two immature ♀♀ examples of *P. regalis*

Walker, in the Oxford Museum, from Tauta and Bhoutan respectively, have these maculæ on the mesonotum only).

Panesthia brevipennis baluensis subsp. n. (Fig. 23).

1893. Brunner, Ann. Mus. Civico (2), Vol. XIII, p. 51. [Amboina].

2 ♂♂, 11 ♂♂ immature, 11 ♀♀, 5 ♀♀ immature, Lumu Lumu 5,500 feet, April, 1929.

1 ♂ immature, 2 ♀♀, 2 ♀♀ immature, Kamborangah, 7,000 feet, March, 1929.

The extensive material from Kinabalu has the wings projecting beyond the tegmina, and the front femora unarmed in most cases. These are the only points by which it seems to differ from *brevipennis* Brunner, from Amboina. At least the fact that Brunner does not mention the wings, justifies one in assuming that they are not exposed in the type. The armature of the front femora is of no great importance, as I have tried to show in "Treubia," Vol. III (1923), p. 214. Brunner describes those of the type as 2 or 3-spined. In the present collection only 1 ♂ has two spines on either front femur; 2 ♀♀ have one spine each on the left femur, and one ♀ has a spine on the right femur, but in the majority of cases the front femora are unarmed.

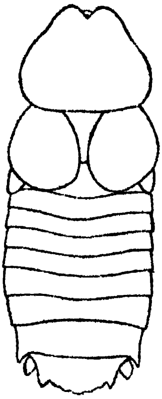

Fig. 23. *Panesthia brevipennis baluensis* subsp. n. ♂. × 1¼.

P. brevipennis baluensis subsp. n. may be described as follows:

♂. Shining black.—Head slightly exposed, shining black; clypeus dull rufous, labrum castaneous, palps dark castaneous to black, ocelli fulvous; interocular distance equal to that between antennal sockets; antennæ with their basal half shining black, distal half with fine rufous pubescence. Pronotum shining black, as the rest of the body; anterior margin with a small rounded emargination, the cornua on either side only very moderately indicated; front part of disk deeply depressed, hinder part strongly raised, with two blunt tubercles. Tegmina much abbreviated, broadly oval, about as wide as long, not quite reaching to the posterior margin of the metanotum, and not quite meeting in the middle line. Wings small, only just projecting beyond the outer posterior angle of the tegmina. Tergites punctured, weakly in front, more coarsely behind. Seventh tergite with the lateral posterior angle tooth-like produced. Supra-anal lamina with 6 faint crenulations and a heavy tooth on either side. Cerci stout, triangular, smooth above, with faint pubescence below. Front femora generally unarmed.

♀. Similar to the ♂, but slightly larger. In a few examples the tegmina are considerably smaller than in the ♂, and separated by nearly one half of the width of the pronotum.

The measurements are:

	♂	♀
Total length	35 mm.	41 mm.
pronotum, length	9.4 ,,	9.5 ,,
pronotum, width	13 ,,	13.5 ,,
tegmina, length	7.5 ,,	9 ,,
tegmina, width	8 ,,	8.5 ,,

I have before me a short series (3 ♂ ♂, 3 ♀ ♀) of a closely allied form from Mt. Penrissen, Sarawak, 4,400 feet (E. Mjöberg, 1924) which seems to be undescribed, and for which I propose the name **P. penrissensis** sp. n. The

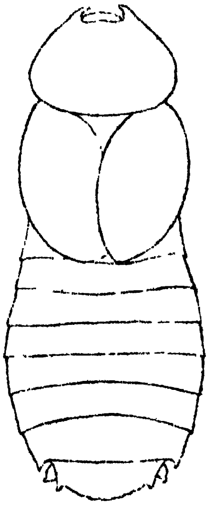

Fig. 24. *Panesthia penrissensis* sp. n. ♂. × 1½.

emargination of the anterior border of the pronotum in the ♂ is deeper and much wider than in *brevipennis;* the cornua at either side of the emargination are strongly developed in the ♂ ; the tegmina of both sexes are larger and overlap to some extent, and are castaneous in colour, as also the more anterior abdominal tergites; the wings do not project beyond the tegmina, and the front femora are armed in all cases, as follows:

	Left ant. femur	Right ant. femur
♂	3 spines	3 spines
♂	3 ,,	3 ,,
♂	1 ,,	3 ,,
♀	3 ,,	3 ,,
♀	2 ,,	3 ,,
♀	2 ,,	2 ,,

And the following table gives the measurements of the type specimens of *penrissensis*:

	♂	♀
Total length	45 mm.	43 mm.
pronotum, length	11 ,,	10 ,,
pronotum, width	15 ,,	14 ,,
tegmina, length	14 ,,	13.5 ,,
tegmina, width	10 ,,	10 ,,

Saussure, in Rev. Suisse Zool., Vol. III (1895), p. 316 reports a somewhat similar species from the Nicobars, *P. nicobarensis* which in his key, on p. 308, he places next to *P. brevipennis* Brunner. He describes the ♂ as black, the pronotum deeply depressed, with a square emargination in front, the tegmina truncate, covering the first abdominal segment, and the front femora with 2 to 3 spines each.—In Stettin. Entom. Zeit., Vol. XCI (1930), p. 195, I placed under *brevipennis* a Blattid ♂ from the Dresden Museum, from Java (Schierbrandt), which has the emargination of the pronotum very shallow, the tegmina slightly overlapping and castaneous, the wings not projecting, and the left front femur with 3 spines (right front femur missing). Almost identical with this specimen is a ♀ example in the Oxford Museum, from Ceram (W. Stalker, 1910), which also has only a slight emargination of the pronotum, the tegmina castaneous and just meeting, the wings not projecting, the left front femur with 3, the right with 4 spines.

Dolichosphæria deplanata Hanitsch.

1923. J., M. B., R. Asiat. Soc., Vol. I, p. 455.
[♀ Gunong Kledang, Perak, 2646 feet].

1 ♀ Kiau, 3,000 feet, 17.3.1929.

This genus which in my original description I had placed at the end of the Perisphærinæ, should be removed to the Panesthinæ and defined as follows: "Apterous. Anterior margin of pronotum and posterior margin of supra-anal lamina entire." It includes two, or perhaps three species, viz. *Panesthia polita* Krauss,[17] from Java and Borneo, of which *D. arcuata* Hanitsch, is a synonym; and *D. deplanata* mihi. The former species has the pronotum entirely smooth, whilst *deplanata* is characterized by two blunt tubercles placed close together near the posterior border of the pronotum. *Panesthia birmanica* Brunner,[18] with its small tubercles ("tuberculis binis centralibus vix distinguendis"), is probably closely allied to *deplanata,* though Brunner describes the anterior margin of its pronotum as truncate. It is distinctly parabolic both in *polita* and in *deplanata.*

The present specimen, ♀, measures only 23 mm. in length, as against 30 mm. of the type (♀) from Perak. It is armed with 2 spines on the left femur, and one on the right, whilst the type has 2 spines on either femur.

I have before me also a few examples of *deplanata* from S. Sarawak (E. Mjöberg, 1924), viz. 1 ♂ and 1 ♀ from Mt. Penrissen, 4,000 feet, measuring 26 mm. and 28 mm. respectively, and bearing two spines on either femur. Two ♀ ♀ examples from Mt. Matang, 25 to 26 mm. in length, bear three spines on either femur.

Hebard who accepts *Dolichosphaeria,* reports *polita* from Dolok Baroe, Sumatra, viz., 1 ♂ and 1 ♀, measuring only 18.3 mm. and 21.2 mm. respectively. The two ♀ ♀ examples which I recorded from Sipora, Mentawi Is., measured 24 mm. and 22 mm. respectively. However, the ♂ from Fort de Kock, Sumatra, which I described as *polita* in Tijdschr. Entom., Vol. LXXII (1929), p. 302, has on further examination proved to be *deplanata.*

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[17] Semon, Zool. Forsch. Austral. Mal. Arch., Vol. V (1903), p. 754.

[18] Annali Mus. Civ., Genova, (2), Vol. XIII (1893), p. 54.

XXII. STAPHYLINIDÆ (COL:) FROM MOUNT KINABALU.

By MALCOLM CAMERON, *M.B.*, *R.N.*, *F.E.S.*

The collection of Staphylinidæ here reported upon was made by Mr. H. M. Pendlebury during a visit to Mount Kinabalu, British North Borneo, between March and May, 1929. An account of this expedition has been published in Part I of this *Journal* (Sept. 1932, pp. 1—38, Map, pls. i—viii).

Of the seventy-seven species of Staphylinidæ collected, forty seven are described as new, as well as two varieties, and in two cases also it was found necessary to erect new genera. The types are in my collection.

OXYTELINÆ.

Eupiestus montanus sp. n.

Build, lustre and colour of *sikkimi* Fauv., but a little larger (3.5 mm.) and more robust, the antennæ black, a little longer and more slender, the penultimate joints in the ♂ distinctly longer than broad, in the ♀ only slightly transverse; head more closely punctured; thorax similarly built but with the costæ much less evident in front, the puncturation finer and much closer; the elytra more closely and less coarsely punctured between the costæ.

Kamborangah, 7,200 feet, 27.3.1929. Four examples.

Priochirus (Triacanthochirus) moultoni Bernh.

Marei Parei, 5,000 feet, 2.5.29. Two examples.

Priochirus (Triacanthochirus) difficilis Cam.

Lumu Lumu, 5,500 feet, 11—16.4.29. Kenokok, 3,300 feet, 26.4.29.

Priochirus (Triacanthochirus) parvidens Cam.

Lumu Lumu, 5,500 feet, 12.4.29. Kamborangah, 7,200 feet, 4.4.29. Three examples.

Thoracochirus piestoides Fauv. var. **cribrellus** Fauv.

Kenokok, 3,200 feet, 24.4.29. One example.

Lispinus longus sp. n.

Elongate, black, shining, the abdomen dull, strongly striate, its apex reddish. Antennæ reddish-brown. Legs reddish-yellow. Length 6 mm.

In general facies very similar to *macroptera* Fauv., but with shorter, more strongly punctured thorax, the sulcus at the posterior angle much shorter, the head less finely punctured, the elytra more shining, less coriaceous, more distinctly punctured. Antennæ a little longer, the penultimate joints very slightly transverse. Head closely, moderately finely punctured, frontal sulci distinct, ground sculpture feeble: thorax slightly transverse, the sides in front feebly rounded, retracted in the posterior third to the briefly rounded posterior angles; along the middle with a very narrow, finely sulcate space; median basal impressions absent, at the posterior angles with a deep sulcus not extending quite half the length of the side; puncturation close, coarser than on the head, ground sculpture fine, longitudinal. Elytra measured from the base almost twice as long as the thorax and more finely, less closely and more superficially punctured, impunctate towards the side, ground sculpture fine, longitudinal. Abdomen elongate, strongly striate and coriaceous.

Lumu Lumu, 5,500 feet, 6—16.4.29. Two examples.

Lispinus distinctus sp. n.

Very black, shining, the apex of the abdomen reddish. Thorax with well marked median and lateral impressions. Antennæ brownish-yellow. Legs reddish-yellow. Length 8.5 mm. (Abdomen well extended).

Scarcely differing in build and antennal structure from *impressicollis* Motsch., but much blacker in colour, the foreparts much more strongly punctured, the coriaceous ground sculpture more marked and the thoracic impressions stronger. Head rather closely, moderately finely punctured except the front which is practically impunctate. Thorax rather more than a third broader than long, the sides rounded in front, retracted and straight behind, along the middle with a narrow impunctate space, at each side of the middle of the base with a distinct impression, the lateral impressions deeper than in *impressicollis* and extending a little beyond the middle of the sides, the disc without four large quadrately placed punctures; puncturation as on the head. Elytra about a third longer than the thorax, moderately closely and less finely punctured, the punctures closer and coarser towards the sides and somewhat elongate, a narrow space between the reflexed margin and the disc, impunctate. Abdomen coriaceous with a few setiferous punctures.

Lumu Lumu, 5,500 feet, 16.4.29. A single specimen.

Megarthrus sumatrensis Cam.

Tenompok Pass, 4,200 feet, 18.3.29. Two examples.

Phlœonomus (s. str.) **affinis** sp. n.

Very closely allied to *germanus* Cam., but with the sides of the thorax finely crenulate and obtusely angulate near the middle, the elytra a third longer than the thorax with fine granular sculpture as in that species. Differs from *crenicollis* Cam., in the completely dull fore-parts, the angulate sides of the thorax and the finer rougher sculpture of the elytra. Length 1.3 mm.

Kenokok, 3,300 feet, 24.4.29.

Phlœonomus (s. str.) **distinctus** sp. n.

Narrow, subdepressed. Head black, dull. Antennæ black, the first three joints yellow. Thorax pitchy, the impressions dull, the rest of the surface shining. Elytra shining, yellowish, about a third longer than the thorax. Abdomen pitchy, shining. Legs yellow. Length 1.3 mm.

Differs from *crenicollis* Cam., in the more shining appearance, scarcely crenulate sides of the thorax, yellow elytra with simple, moderately coarse and rather close puncturation, the shorter antennæ with more strongly transverse penultimate joints and the much less strong ground sculpture especially on the abdomen which is very finely and sparingly punctured. The colour, lustre and sculpture of the elytra very similar to that of *chlorizans* Fauv., but distinguished from that species by the duller, more strongly coriaceous head and thorax and deeper sulci of the latter.

Kenokok, 3,300 feet, 24.4.29. One example.

The type is from Sumatra, Fort de Kock. I have specimens from Penang and the Philippines.

Oxytelopsis nigricans sp. n.

Pitchy black, dull, rugose. Antennæ with the first three joints yellow, the rest infuscate. Femora reddish-brown, tibiæ blackish, tarsi yellowish. Length 4 mm.

A little larger and more robust than *cimicoides* Fauv., the colour darker, the antennæ shorter with more transverse penultimate joints, head with the posterior angles much more pronounced, everted, sculpture of the head and thorax coarser, elytra less closely sculptured, duller, thorax broader, the sides much less distinctly crenulate.

Tenompok Pass, 4,200 feet, 18.3.29. Two examples.

Delopsis borneensis sp. n.

Very near *flavicornis* Cam., but differing in the following respects: the head is not dilated behind, the eyes much larger, the transverse impression before the base less distinct, the sculpture much less coarse, the antennæ are shorter, black, only the first two joints pitchy-yellow, the penultimate joints as long as broad, the thorax with the impressions deeper, the sides less strongly crenulate, the sculpture less coarse, elytra less coarsely sculptured. Abdomen less shining, much more closely punctured. Length 3 mm.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Oxytelus (s. str.) **borneensis** sp. n.

Shining, head black, thorax pitchy black, the sides narrowly reddish. Elytra reddish, darker about the scutellum. Abdomen black, the posterior margins and the last two segments reddish. Antennæ reddish. Legs yellow. Length 4.5 mm.

Very distinct by the strongly rugose sculpture and shining appearance. Head short and broad, subtriangular, widest behind the eyes, these small, much shorter than the rounded postocular region. Antennal tubercles and a transverse space between, impunctate, the rest of the surface very closely, coarsely and rugosely punctured, the clypeus also with some large punctures. Antennæ with the 1st joint elongate, gradually thickened towards the apex, 3rd a little shorter than the 2nd, 4th and 5th about as long as broad, 6th to 10th transverse gradually increasing in width. Thorax transverse, wider than the head, sides very slightly rounded and with five or six crenulations, slightly retracted behind to the rounded posterior angles; median sulcus narrow limited by an elevated impunctate ridge on each side, lateral sulci obsolete, the puncturation very coarse, irregular, close and rugose, here and there confluent. Elytra a little longer than the thorax, very closely, deeply and coarsely punctured, but less coarsely than the thorax. Abdomen shining, the first three visible segments closely coarsely and rugosely punctured, the 4th less closely, the 5th and 6th almost impunctate.

♂ : unknown.

Lumu Lumu, 5,500 feet, 9.4.29. A single specimen.

Oxytelus (Anotylus) deceptor sp. n.

Near *exasperatus* Kr., the sculpture similar but coarser, the lustre similar, larger (4 mm.) and blacker, the antennæ darker at the base, head in the ♂ much more widened behind and the thorax shorter and broader. In the ♀ the head is not widened behind. Abdomen without special characters in the ♂.

Lumu Lumu, 5,500 feet, 6.4.29 (Type). Kenokok, 3,300 feet, 23.4.29.

Osorius bicornutus Cam.

Lumu Lumu, 5,500 feet, Marei Parei, 5,000 feet, 6—24.4.29.

Four examples.

Osorius sparsifrons Cam.

Lumu Lumu, 5,500 feet, 8.4.29. Two examples.

Osorius planifrons Cam.

Lumu Lumu, 5,500 feet, 16.4.29. One example.

Osorius cribrum Bernh.

Kenokok, 3,300 feet, 24.4.29. Two examples.

Osorius dentifrons sp. n.

Black, shining, cylindrical. Front smooth, at the sides with a few small asperate granules, the front margin very slightly rounded and furnished with eight acute teeth. Antennæ and legs reddish-yellow. Length 7 mm.

Readily distinguished by the dentate front margin of the head, the front is smooth with a few small asperate punctures at the sides, finely striate and less shining against the eyes, the rest of the interocular region with superficial, more or less elongate and confluent impressions and fine sparing punctures. Antennæ with the penultimate joints about as long as broad. Thorax slightly transverse, the anterior angles not prominent, the sides almost straight, gradually retracted backwards for the first two-thirds, then more strongly to the obtusely rounded posterior angles which are not at all explanate or impressed: along the middle with a narrow impunctate space, elsewhere moderately finely, uniformly and moderately closely punctured. Elytra a little longer than the thorax. With distinct uniform puncturation, about as close but a little coarser than that of the thorax. Abdomen coriaceous, finely but not closely punctured.

Kenokok, 3,300 feet, 23.4.29. A single specimen.

MEGALOPINÆ.

Megalopsidia (s. str.) **borneensis** sp. n.

Shining; reddish-brown, the elytra reddish-yellow with indeterminate blackish markings; one small, behind the humeral callus, and the other larger situated near the posterior margin and suture and extending nearly to the middle of the disc; the posterior angles somewhat infuscate. Elevated side margins of the abdomen and posterior margin of the last two segments, yellowish. Antennæ reddish-yellow, the club infuscate. Legs yellow, the apex of the middle and posterior femora blackish. Length 4 mm.

Head broader than the thorax closely and coarsely punctured. Antennæ with 3-jointed club, the 1st joint very small, the 2nd much wider, the 3rd large and conical. Thorax a little broader than long, the sides gradually and slightly retracted behind, viewed from above each presenting four small teeth, across the middle with obsolete transverse sulcus, before the base with two broad, obsolete, diverging impressions separated from each other by a short, impunctate keel and bounded externally by a small impunctate callus, the rest of the surface covered with very coarse, close, rugose punctures. Elytra a little longer than the thorax, as broad as the head, externally with two rows of large, closely placed punctures situated in sulci, internally and on the reflexed margin with large irregular, close punctures. Abdomen practically impunctate, the first four visible segments each with two small oblique impressions on either side at the base.

Lumu Lumu, 5,500 feet, 16.4.29. Unique.

PAEDERINÆ.

Palaminus germanus Cam.

Kamborangah, 7,200 feet, 26.3.29. Two examples.

Pæderus sondaicus Fauv.

Kiau, 3,000 feet, 16.3.29. One example.

Pæderus fuscipes Curt.

Kamborangah, 7,200 feet, 28.3.29. One example.

Medon mjöbergi Cam.

Kenokok, 3,300 feet, 24.4.29. One example.

Lumu Lumu, 5,500 feet, 6—16.4.29. Three examples.

Medon (Hypomedon) nigrituloides sp. n.

Moderately shining, black, finely pubescent. Antennæ and legs reddish-yellow. Length 3 mm.

Not unlike *nigritulus* Er.: of the same colour and lustre but narrower, the 4th joint of the antennæ shorter, the penultimate joints rather more transverse, head a little narrower, very finely, closely punctured. Thorax narrower, a little more retracted behind, with narrow smooth median space, the puncturation as on the head. Elytra more finely and less roughly punctured than in *nigritulus*. Abdomen more finely and a little less closely punctured with finer pubescence than in that species.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Lithocharis distinguenda Cam.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Lithocharis carinata Cam.

Kenokok, 3,300 feet, 23.4.29. Three specimens.

Eunalagium diabolicum Bernh.

Kenokok, 3,300 feet, 23.4.29. One specimen.

STAPHYLININÆ.

Metolinus borneensis sp. n.

Linear, black, shining. Antennæ, palpi and legs reddish-yellow. Length 6 mm.

Narrower than *leucocnemis* Kr. Head oval, wider behind, more uniformly rounded behind the eyes than in *leucocnemis* and with fewer punctures: median sulci represented by two small punctures one behind the other on each side, the lateral sulci very short. Antennæ a little longer and more slender, the penultimate joints less transverse, the 11th joint longer. Thorax longer and narrower with five small punctures on each side of the middle line, more externally with four others. Elytra narrower, but scarcely differing in sculpture from *leucocnemis*. Femora not at all infuscate.

Pakka, 10,200 feet, 21—23.3.29. Six specimens.

Pachycorynus dilaticeps Cam.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Leptacinus cribricollis Fauv. var. **borneensis** n.

This variety is distinguished from the type form by the black colour and in some examples by the rather wider head and the larger size, 4 mm.

Kenokok, 3,300 feet, 23.4.29. Four examples.

Indoscitalinus borneensis Bernh.

Kenokok, 3,300 feet, 23.4.29. One example.

Diochus borneensis sp. n.

Black, shining. Antennæ black, the first three joints brownish-yellow. Femora and tarsi brownish-yellow, the tibiæ black. Length 5.75 mm.

At once distinguished from the oriental species by the black tibiæ. About the size of *conicollis* Motsch., but the head is oval, the antennæ shorter with the penultimate joints as long as broad, thorax rather more narrowed towards the front. Abdomen less finely and less densely punctured than in that species with the pubescence much less dense.

Kenokok, 3,300 feet, 23.4.29. One example.

Philonthus cyaneoviolaceus Bernh.

Lumu Lumu, 5,500 feet, 12—15.4.29. Tenompok Pass, 4,200 feet, 18.3.29. Kamborangah, 7,200 feet, 27.3.29.

The dorsal row of punctures on the thorax varies from four to six and sometimes are unequal on the two sides.

Philonthus sparsipennis sp. n.

Black, very shining, the head and thorax with slight bluish reflex, the latter with dorsal row of four punctures. Antennæ and legs black. Length 6—7 mm.

In build not unlike *femoralis* Hochh., but in all other respects quite different. Head oval oblong, scarcely narrower than the thorax, the interocular punctures very close together and near the eyes, these flat, almost as long as the postocular region. Antennæ with the 3rd joint longer than the 2nd, 4th a little longer than broad, 5th and 6th as long as broad, 7th to 10th moderately transverse. Thorax oblong, the sides practically parallel, the dorsal row consisting of four moderate punctures and externally with three others. Elytra broader and scarcely longer than the thorax, with a few rather small punctures. Abdomen very shining, across the middle and along the posterior margin of each segment with a row of extremely fine punctures, otherwise practically impunctate. First joint of the posterior tarsi shorter than the last: anterior tarsi simple in both sexes.

♂ : 6th ventral segment with very small triangular impression, its base feebly emarginate.

Lumu Lumu, 5,500 feet, 16.4.29. Two specimens.

Philonthus nigripes Cam.

Kenokok, 3,300 feet, 23.4.29. Five specimens. Type from Malay Peninsula (Raffles Mus. Bull. No. 7, 1932, p. 141).

Philonthus segregatus sp. n.

Colour, lustre and ground sculpture of *ventralis* Gr.; but larger (8 mm.) and with shorter, broader thorax more narrowed in front and with six punctures in the dorsal row. Both it and the head shew in certain lights a sericeous reflex in places. ♂ : head large, quadrate, as long and as broad as the thorax, the posterior angles rounded, the eyes small, much shorter than the temples, impressed in the middle of the front, the median interocular punctures more widely separated from each other than from the lateral, impunctate along the middle, on each side with numerous umbilicate punctures of the same size as the interocular ones, the temples with finer and less numerous punctures; ground sculpture strong and wavy as in *ventralis*. Antennæ black, the 3rd joint longer than the 2nd, 4th slightly longer than broad, 5th to 10th moderately transverse, the 11th short, oval. Mandibles prominent. Thorax a little broader than long, the sides gently rounded, strongly retracted in front, with a dorsal row of six moderate punctures, externally with three others; ground sculpture as on the head. Elytra a fourth longer and a little broader than the thorax, closely and rather finely punctured and pubescent. Abdomen pitchy, extremely finely and very closely punctured and pubescent, subsericeous. Legs black, the femora brownish-yellow. Anterior tarsi simple. Posterior tarsi short, the 1st joint as long as the last. 6th ventral segment with a very small emargination.

Lumu Lumu, 5,500 feet, 17.4.29. Unique.

Philonthus (Gabrius) viduus sp. n.

Black, head and thorax very, elytra and abdomen less, shining. Thorax with dorsal row of six punctures. Antennæ and legs black, the femora dark brown. Length 7.5 mm.

In build very similar to *femoralis* Hochh., but larger, blacker, the antennæ longer, the puncturation of the elytra and abdomen very much finer and closer. Head oval-oblong, as broad as the thorax, the eye shorter than the postocular region. Antennæ long and slender, the penultimate joints slightly longer than broad. Thorax longer than broad, the sides straight, parallel. Elytra broader and a little longer than the thorax, extremely finely, closely punctured. Abdomen a little more finely and closely punctured throughout than the elytra, finely pubescent. First joint of posterior tarsi shorter than the last.

♂ : 6th ventral segment with acute triangular impression, its base with an arcuate emargination.

Kamborangah, 7,200 feet, 7.4.29. Lumu Lumu 5,500 feet, 12.4.29. Four examples.

Philonthus (Gabrius) submetallicus sp. n.

Black, shining, the head and thorax with slight greenish-violaceous reflex. Thorax with dorsal row of six punctures. Antennæ black, the first two joints pitchy testaceous. Legs yellow, the tibiæ black. Length 5 mm.

Distinct from *nigritulus* Gr., by the more robust build, larger head and metallic reflex of this and the thorax. Head in ♂ larger, quadrate, broader than the thorax, in the ♀ as broad as the latter, in both sexes distinctly sulcate in front in the middle. Antennæ as in *nigritulus*. Elytra as long as the thorax, the puncturation much stronger than in that species, whilst that of the abdomen is much less closely punctured than in *nigritulus*.

Lumu Lumu, 5,500 feet, 14—16.4.29. Three examples.

Belonuchus borneensis sp. n.

Black, shining, the head and thorax here and there with golden sericeous reflex. Antennæ black, the last two joints orange red. Legs black. Length 8 mm.

Size and build of *rufoniger* Fauv., but differently coloured, the penultimate joints of the antennæ less transverse, the dorsal row of thoracic punctures smaller and more numerous, the elytra a little longer and rather more finely punctured, the ground sculpture of the head and thorax finer. Head a little broader than the thorax, quadrate, the posterior angles rounded without trace of denticle, in the middle of the front finely sulcate. With four small punctures placed quadrately towards the front and with two others placed obliquely on each side of the vertex, at the posterior margin of the eye with a group of four or five closely placed punctures, on the temples and along the base with a few others. Thorax trapezoidal, without trace of emargination behind the anterior angles which are not prominent; on each side of the middle line with a row of eight punctures, closely placed and rather small, a single one placed externally at the level of the third and more anteriorly nearer the lateral margin with four or five others. Elytra a fourth longer than the thorax, rather finely and rather closely punctured. Abdomen moderately closely and moderately finely punctured.

Kenokok, 3,300 feet, 23.4.29. One ♀ example.

Dysanellus brevipennis sp. n.

Fore parts distinctly coriaceous, less shining than the abdomen, head and abdomen black, the latter slightly iridescent, the thorax and elytra pitchy black, the former with a dorsal row of six moderate punctures on each side of the middle. Antennæ and legs dark reddish-brown. Length 13 mm.

Head as wide as the thorax, orbicular, the eyes large, but shorter than the postocular region, along the inner margin of each with a row of four small umbilicate punctures and between the eye and the base with a few others; ground sculpture distinct, coriaceous. Antennæ moderate, the 3rd joint a little longer than the 2nd, 4th to 7th longer than broad gradually decreasing in length, the 8th and 10th as long as broad, 11th oval, nearly as long as the two preceding together. Thorax a little longer than broad widest about the middle, the sides scarcely rounded, each with a long black seta, the angles broadly rounded, on each side of the middle with a row of six moderate punctures and antero-externally with five others arranged in a circle; ground sculpture as on the head. Elytra as broad as but a good deal shorter than the thorax, with fine, sparing setiferous punctures and coriaceous ground sculpture, the sides each with two long black setæ. Abdomen finely, not closely punctured throughout, the pubescence rather sparing, the ground sculpture much finer than on the fore-parts, transversely strigose.

Pakka, 10,200 feet, 23.3.29. One ♀ example.

Quedius borneensis sp. n.

Black, head and thorax more shining than the elytra and abdomen, the latter iridescent. Antennæ black, the last three joints reddish-yellow. Legs black. Length 11.3 mm.

In the very large and prominent eyes resembles the species of the *Indoquedius* group, but the antennæ are less slender and the thorax longer. Head large, transverse, orbicular, as broad as the thorax, eyes very large, prominent, the postocular region very short, along the inner margin of each eye with a row of small punctures and another puncture on each side of the base. Antennæ slender, the 3rd joint longer than the 2nd, the following all distinctly longer than broad, gradually decreasing in length, the 11th as long as the 10th. Thorax scarcely broader than long, a little narrowed in front, broadly rounded behind, on either side towards the front with two small approximate punctures obliquely placed, otherwise (except for the usual marginal punctures) impunctate, and like the head without ground sculpture. Elytra a little broader but scarcely longer than the thorax, coarsely and closely punctured like the scutellum and with a fine grey pubescence. Abdomen narrowed behind, moderately finely and moderately closely punctured and pubescent.

Kenokok, 3,300 feet, 23.4.29. A single specimen.

Acylophorus borneensis sp. n.

Larger (9 mm.) than *scutellaris* Bernh., (*longiceps* Cam.) the head oval, broader than in that species but narrower than in *glaberrimus* Hbst. Thorax scarcely broader than long, less narrowed in front than in *scutellaris*, on each side of the middle line near the centre with a puncture. Scutellum with four small punctures near the apex. Elytra as long as but a little broader than the thorax, more finely, less closely and less roughly punctured than in *scutellaris*. Abdomen narrowed behind, iridescent, more closely punctured than in the last named species. Antennæ entirely black, scarcely differing in structure from *scutellaris*. Legs black, tarsi pitchy.

Kamborangah, 7,200 feet, 26.3.29. A single specimen.

TACHYPORINÆ.

Conosoma pendleburyi sp. n.

Size and build of *littoreum* L., but of a dull sooty black colour, densely and finely pubescent, the elytra except for the base and greater part of the sides, obscurely and indeterminately reddish. The head is more shining and less pubescent than elsewhere. The antennæ are entirely black, the penultimate joints a little longer than in *littoreum*. Legs yellow, the tibiæ and tarsi infuscate. Length 5 mm.

Kamborangah, 7,200 feet, 28.3.29. A single specimen.

Conosoma borneense sp. n.

In size build and colour resembling *immaculatum* Steph., but much more shining, much less closely punctured and much less closely pubescent. The antennæ are black, longer than in *immaculatum*, the first two joints and apex of the last, yellow, the intermediate joints distinctly longer than in that species and the penultimate as long as broad. Legs yellow. Length, 4 mm. (abdomen extended).

Pakka, 10,200 feet, 21—23.3.29. Three specimens.

Tachinomorphus fulvipes Er. var. **apicicornis** n.

Differs from the type form in the last three antennal joints being pale yellow. The 1st joint is reddish-yellow and the 2nd and 3rd reddish-yellow at the base. The elytra are black with an obscure indeterminate reddish marking on the disc nearly reaching the posterior margin.

Kenokok, 3,300 feet, 23—26.4.29. Two examples.

Coproporus sanguinolentus Motsch.

Kenokok, 3,300 feet, 26.4.29. Two examples.

Coproporus sumatrensis Bernh.

Kenokok, 3,300 feet, 23.4.29. One example.

Coproporus iridescens Cam.

Kenokok, 3,300 feet, 23.4.29. Two examples.

ALEOCHARINÆ.

Myllæna laticollis sp. n.

Moderately shining. Head and abdomen black, thorax and elytra pitchy-black, the posterior margin of the latter very narrowly and obscurely lighter. Antennæ black, the first two joints brownish-yellow. Legs reddish-yellow, the tibiæ slightly infuscate. Length 3 mm.

In the short broad thorax resembling *japonica* Shp., but in other respects quite different. Head very finely rather closely punctured, finely grey pubescent. Antennæ rather long, distinctly thickened towards the apex, the 2nd and 3rd joints of equal length, 4th to 10th all longer than broad, gradually decreasing in length, the 10th only a little longer than broad, the 11th as long as the two preceding together, oval. Thorax about twice as broad as long, widest about the middle, the sides gently rounded, strongly retracted in front, much less strongly behind, the posterior angles obtusely rounded, the puncturation and pubescence as on the head. Elytra broader and nearly twice as long as the thorax, with fine, close, rough sculpture and close grey pubescence. Abdomen rather strongly narrowed behind, finely and closely punctured, a little more sparingly behind, the pubescence close, short, stiff and greyish.

Kamborangah, 7,200 feet, 26.3.29. Two specimens.

Myllæna affinis sp. n.

Differs from the preceding in the following respects: all the margins of the thorax are narrowly and obscurely reddish, the posterior margin of the elytra narrowly and distinctly reddish, the legs entirely reddish-yellow, the first four joints of the antennæ reddish-yellow, the intermediate joints shorter, the penultimate scarcely longer than broad, the elytra shorter, about a third longer than the thorax, much less roughly and much less closely punctured, the abdomen is closely and rather coarsely punctured at base of the segment, more finely and less closely elsewhere, the pubescence is coarser and longer throughout.

Kamborangah, 7,200 feet, 27.3.29. One specimen.

Eusteniamorpha borneensis sp. n.

Black, shining. Antennæ reddish-brown. Legs reddish-yellow. Length 2.5 mm.

Head a little narrower than the thorax, smooth in front, the rest of the surface closely, moderately coarsely punctured. Antennæ with the 3rd joint a little shorter than the 2nd, 4th and 5th a little longer than broad, 6th to 10th transverse. Thorax a little broader than long, flask-shaped, the sides strongly dilated and rounded in front, strongly arcuately retracted behind to the slightly obtuse posterior angles; along the middle deeply sulcate, at each side of the base with a curved impression, the sculpture as on the head except on the dilated anterior part which is almost impunctate. Scutellum impunctate. Elytra broader and about a third longer than the thorax, the puncturation on the inner half fine and not very close, externally much coarser and closer, the reflexed sides impunctate. Abdomen a little narrowed at the base, the first three visible segments transversely impressed at the base, the first of them with a median keel throughout, the two following with short basal keel, the puncturation in the impressions coarser and closer than on the rest of the surface where it is fine and scanty. The whole insect covered with a moderately long greyish pubescence.

Lumu Lumu, 5,500 feet, 6—16.4.29. Four specimens.

Genus **Paroxypodinus** gen. n.

Facies of *Oxypodinus* Bernh., but differing in the structure of the mouth parts. Head with complete and distinct infra-temporal ridge. Gular sutures widely separated, slightly convergent in front. Antennæ 11-jointed. Labrum transverse, almost truncate in front, the angles rounded. Mandibles short, pointed, the right with two, the left with one, small sharp teeth. Maxillæ with the inner lobe narrower than the outer, the apical half of the inner margin with fine rather long and slightly curved spines, the basal half with long hairs; outer lobe membranous at the apex and covered with very short fine hairs. Maxillary palpi 5-jointed, the 1st joint very small, 2nd moderate, gradually thickened towards the apex, 3rd about as long but more enlarged apically than the 2nd, 4th subulate, about half as long as the 3rd, 5th membranous, almost as broad and nearly half as long as the 4th.

Mentum transverse, trapezoidal, truncate in front. Labial palpi 4-jointed, the 1st joint stout, cylindrical, 2nd narrower and much shorter, scarcely longer than broad, 3rd much narrower, longer than the 2nd, 4th membranous about half as long as the 3rd, conical. Tongue small, divided half way to the base into two narrow diverging lobes with rounded apex. Thorax transverse, pronotal epipleura strongly deflexed, not visible when viewed from the side. Mesosternal process triangular, pointed, extending nearly the whole length of the coxæ, these moderately separated, the metasternal process narrowly rounded and meeting the mesosternum. Tibiæ finely ciliate. Anterior and middle tarsi 4-jointed, the first three joints short, subequal, the 4th a little longer than the three preceding together; posterior 5-jointed, the first two equal, rather short, 3rd and 4th a little shorter, equal. Claws slender, lightly curved. Genotype: the following species.

Paroxypodinus pendleburyi sp. n.

Moderately shining, reddish-yellow, the abdomen pitchy-black, the whole of the last segment and the posterior margins of the others narrowly reddish-yellow. Antennæ with the first five joints yellow, the rest black. Legs reddish-yellow. Length 3 to 3.5 mm.

Facies of *Oxypodinus*. Head transverse, suborbicular, much narrower than the thorax, the eyes large and a little prominent, uniformly covered with rather small, rather close superficial punctures except in front which is impunctate and with coriaceous ground sculpture. Antennæ rather short, the 3rd joint narrower and a little shorter than the 2nd, 4th about as long as broad, 5th to 10th transverse, gradually increasing in width, the penultimate strongly transverse, 11th short and stout, scarcely as long as the two preceding together. Thorax short more than half as broad again as long, the sides strongly rounded, more retracted in front, posteriorly coarctate with the base; sculpture as on the head. Elytra broader and a third longer than the thorax, with fine, rather close asperate punctuation, with ground sculpture as on the fore-parts. Abdomen gradually narrowed behind, rather closely covered with fine elongate punctures.

♂ : 1st visible segment at the middle of the posterior margin with a curved spine; 6th truncate its margin finely dentate, closely covered with pointed granules; 5th more strongly sculptured than in the ♀ and with a more or less distinct median keel behind.

Kamborangah, 7,200 feet, 28.3.29, 4.4.29. One hundred and thirty specimens.

Stenomastax gen. n. for Homalota nigrescens Fauv.

In facies resembling *Homalota plana* Mannh. but entirely different in the structure of the mouth parts. Head transverse, suborbicular, temples finely bordered below; gular sutures distant, parallel. Labrum transverse, setiferous, the angles rounded, very slightly emarginate in the middle of the anterior border, the emargination furnished with two minute nipple-shaped membranous appendages. Mandibles small, curved, pointed, edentate. Maxilla with the outer lobe narrow, not extending beyond the inner, its apex membranous and furnished with short hairs; inner lobe narrow, its inner border with about ten teeth, the four posterior ones much longer than the others. Maxillary palpi 4-jointed, the 1st joint very small, 2nd elongate gradually thickened towards the apex, the 3rd as long but a good deal broader apically than the 2nd, the 4th subulate, about one third as long as the 3rd. Mentum transverse, trapezoidal, scarcely emarginate in front. Labial palpi very long, styliform, indistinctly 2-jointed, the 2nd joint a little longer than the 1st. Tongue very narrow, elongate, simple, extending quite to the middle of the 2nd joint of the labial palpi. Paraglossæ fine, ciliate extending about-half the length of the 1st joint of the palpus. Pronotal epipleura visible from the side. Prosternum keeled behind in the middle. Mesosternal process narrow, pointed, extending two thirds of the length of the coxæ and meeting the narrow rounded apex of the anterior metasternal process, the coxæ narrowly separated throughout. All the tibiæ with two long black setæ externally. Tarsi 4, 4, 5, the basal joints all short and subequal, the anterior and middle with the 4th joint longer than the preceding together, the posterior with the 5th joint about as long as the four preceding together. Elytra feebly sinuate postero-externally. Abdomen with long black setæ at the sides and apex. The type of the genus is *Homalota nigrescens* Fauv., a species widely distributed in the oriental region and found in rotting fruit and thus quite different in habits from the subcortical genus *Homalota.* It will probably be found that the rest of the oriental species referred to this genus will have to be removed from it.

Stenomastax nigrescens (Fauv.).

Kenokok, 3,300 feet, 23.4.29. Nine specimens.

Stenomastax borneensis sp. n.

Greasy lustrous. Head black, thorax and abdomen reddish, the latter with the 4th visible segment blackish, elytra pitchy-black, very obscurely reddish at the base. Antennæ yellowish-red. Legs reddish-yellow. Length 2 mm.

In build intermediate between *Homalota* (?) *platygaster* and *variventris*. Head transverse, suborbicular, narrower than the thorax, the eyes large, more shining and impunctate in front, elsewhere closely and finely punctured. Antennæ with the 2nd and 3rd joints of equal length, the 4th slightly longer than broad, 5th as long as broad, 6th to 10th moderately transverse, 11th as long as the two preceding together. Thorax about a third broader than long, the sides very slightly rounded, a little more retracted behind, the posterior angles obtuse, along the middle distinctly impressed, the puncturation very fine, rather close and asperate. Elytra broader and a third longer than the thorax, very feebly sinuate postero-externally, very finely, closely and asperately punctured. Abdomen very finely, rather closely punctured, a little more sparingly behind. The whole insect with a fine, moderately close pubescence.

♂ : (?) 8th dorsal segment truncate; 6th ventral segment a little produced, narrowed and rounded at apex.

Lumu Lumu, 5,500 feet, 12.4.29. A single specimen.

Ousilusa crassicornis Cam.

Kenokok, 3,300 feet, 23—24.4.29. Lumu Lumu, 5,500 feet, 6—16.4.29. Six specimens.

The description given of the ♂ characters (Journ. Sarawak Mus., iii, 1928, p. 414) are those of the ♀. The ♂ has the last dorsal segment gradually narrowed and rounded at the apex with a minute emargination in the middle and covered with several flat tubercles; on each side of the plate and separated from it by a deep acute excision is a curved pointed spine.

Cœnonica borneensis sp. n.

Subopaque; head black, thorax reddish-brown, elytra pitchy-black, abdomen more shining, yellowish-red, the 4th visible segment blackish. Antennæ with the first three joints and apex of the last yellow, the rest infuscate. Legs reddish-yellow. Length 2.5 mm.

Head narrower than the thorax, the eyes rather large, but not prominent, coriaceous and with close, small, superficial umbilicate punctures. Antennæ short, the 4th to 10th joints transverse, the penultimate strongly so. Thorax a little broader than long, the sides gently rounded in front, straight and more retracted behind to the obtuse posterior angles, broadly superficially impressed in the middle of the posterior half, densely coriaceous and with close, superficial, umbilicate punctures larger than those on the head but difficult to see on account of the ground sculpture. Elytra broader and about a third longer than the thorax, sinuate postero-externally, with close, fine, asperate sculpture. Abdomen with fine, separate, not very close sculpture, more sparing behind.

Lumu Lumu, 5,500 feet, 16.4.29. One specimen, apparently ♀.

Cœnonica soror sp. n.

Subopaque, the abdomen more shining. Head black, thorax reddish-brown, elytra brownish-yellow, abdomen reddish-yellow, the 4th and 5th (visible) segments blackish. Antennæ reddish-yellow, the first three joints and apex of the last yellow. Legs reddish-yellow. Length 3 mm.

A little larger than the preceding, similar in build but with the antennæ longer, the 4th joint not transverse and the following less transverse than in *borneensis*.

Head and thorax densely coriaceous without punctuation, the latter with the median impression deeper, narrowed in front and extending nearly to the anterior border. Elytra finely coriaceous, less closely, more finely, much less roughly sculptured than in *borneensis*, the abdomen more finely, less asperately punctured than in that species.

Kamborangah, 7,200 feet, 28.3.29. One specimen, apparently ♀.

Cœnonica nigrita sp. n.

Subopaque, black, the elytra pitchy-black, the abdomen more shining, the posterior margin of the segments very obscurely reddish. Antennæ black, the first two joints reddish-yellow. Legs reddish-yellow. Length, 3 mm.

Differs from *soror* in the colour, the posterior angles of the thorax produced into an acute denticle, the middle of the base with a V-shaped impression and the elytral sculpture less fine and more asperate, in other respects similar. Kamborangah, 7,500 feet, 27.3.29. Two specimens apparently ♀.

Cœnonica monticola sp. n.

Colour, lustre and build of *nigrita* with similar dense coriaceous ground sculpture and absence of puncturation on the head and thorax, but the latter with obtuse posterior angles and with the median impression not U-shaped, gradually narrowed in front and nearly reaching the anterior border: the elytra are a little longer, equally closely but less finely and yet more roughly punctured, the eyes a little smaller, the antennæ shorter with the first two joints pitchy-yellow, the 4th joint distinctly transverse and the following more transverse than in *nigrita.*

Pakka, 10,200 feet, 21.3.29. One specimen.

Placusa acuminata Kr. (?)

Kenokok, 3,300 feet, 23.4.29. One immature specimen.

Leptusa (Pisalia) borneensis sp. n.

Rather shining; head black, thorax reddish-brown, elytra pitchy-black, abdomen black, the first two visible segments sometimes reddish, the last reddish-yellow. Antennæ with the first three joints reddish-yellow, the following reddish. Legs reddish-yellow. Length 2.5 mm.

Somewhat resembling *piceata* Rey, in build. Head round, narrower than the thorax, with a small fovea in the middle of the front, the eyes very small, distinctly coriaceous but without puncturation. Antennæ with the 2nd and 3rd joints of equal length, 4th slightly, 5th to 10th gradually more strongly transverse, the penultimate about 2½ times broader than long. Thorax transverse, scarcely a third broader than long, the sides rounded and dilated in front, strongly retracted in the posterior third to the obtusely rounded posterior angles; sculpture as on the head. Elytra narrower and a third shorter than the thorax, a little dilated behind, with fine, close, granular sculpture. Abdomen a little narrowed at the base and with a fine sparing puncturation. The whole insect covered with a scant yellowish pubescence.

♂ : 8th dorsal segment very slightly rounded and with seven or eight short sharp teeth.

Pakka, 10,200 feet, 21.3.29. Three specimens.

Falagria (Anaulacaspis) amabilis sp. n.

Shining; head black, thorax pitch-brown, elytra brownish-yellow, abdomen pitchy, the first two visible segments yellow-brown. Antennæ reddish, the first three joints reddish-yellow. Legs reddish-yellow, the femora infuscate. Length 3.2 mm.

Somewhat resembling *thoracica* F., in build, but with the thorax wider in front and more retracted behind. Head as wide as the thorax. Very finely, moderately closely punctured, the antennæ rather short and stout, the 4th to 10th joints transverse, the penultimate less transverse than in *thoracica.* Thorax as broad as long, the sides strongly dilated and rounded in front, strongly retracted behind, the posterior angles obtuse, deeply sulcate along the middle, finely, moderately closely punctured, more closely than in *thoracica.* Scutellum granular. Elytra longer and broader than the thorax, very finely and closely granular at the base and scutellary region, exceedingly finely punctured elsewhere except near the sides where there are a few large superficial punctures, the reflexed sides extremely finely punctured. Abdomen rather coarsely and closely punctured in the basal depressions. Very finely and rather closely elsewhere.

Kenokok, 3,300 feet, 23.4.29. Three specimens.

Falagria (Stenagria) proxima sp. n.

Colour and build of *concinna* Er., but smaller (2.3 mm.) the antennæ longer and more slender, the penultimate joints a little longer than broad, thorax less finely punctured, elytra less closely punctured; in other respects similar.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Falagria (Stenagria) monticola Cam.

Kenokok, 3,300 feet, 23.4.29. Lumu Lumu, 5,500 feet, 15.4.29. Five specimens.

Falagria (Stenagria) seminitens sp. n.

Head and thorax black, dull, elytra and abdomen moderately shining, pitchy-black, the former with the base narrowly and obscurely yellowish-brown, the latter with the first visible segment yellow. Antennæ black, the first two joints reddish-yellow. Legs blackish, the base of the femora and the tarsi yellow. Length 4 mm.

Very similar in build to *monticola* Cam., but a little narrower, the head much more strongly narrowed behind, the antennæ longer and more slender, the thoracic sulcus much less deep. Head and thorax strongly coriaceous without puncturation. Antennæ with all the joints much longer than broad. Scutellum with a fine median keel at the base. Elytra extremely finely, rather closely, asperately punctured. Abdomen very finely and closely punctured, more closely on the last two segments.

Tenompok Pass, 4,700 feet, 18.3.29. Seven specimens.

Falagria (Stenagria) sparsipennis sp. n.

Very shining, black, the elytra brownish-yellow, the first visible segment of the abdomen yellow. Antennæ reddish, the first three joints reddish-yellow. Legs blackish, the base of the femora and the tarsi yellow. Length 4 mm.

Differs from *monticola* Cam., in the much shorter thorax, much shorter and stouter antennæ, the intermediate joints much shorter, the penultimate only slightly longer than broad, the head and thorax much more sparingly punctured and the very finely and very sparingly punctured elytra and abdomen.

Tenompok Pass, 4,200 feet, 18.3.29. One specimen.

Gnypeta (?) abdominalis sp. n.

Shining; head black, thorax reddish, elytra pitchy-black, very obscurely lighter at the base, abdomen reddish-yellow, the 4th visible segment and anterior half of the 5th black. Antennæ black, the first two joints and the last, yellow. Legs yellow. Length 3 mm.

In colour somewhat similar to *variegata* Bernh., but the elytra more obscure, the build narrower and the antennæ much longer and more slender. Head suborbicular, as broad as the thorax, eyes rather large, finely, not very closely punctured. Antennæ with the 3rd joint longer than the 2nd, 4th to 9th all longer than broad, gradually decreasing in length, 10th about as long as broad, 11th as long as the 9th and 10th together. Thorax transverse, the sides rounded and dilated in front, retracted behind to the obtuse posterior angles, narrowly sulcate in the middle of the posterior half, very finely and rather closely punctured. Scutellum finely granular. Elytra a third longer and a good deal broader than the thorax, very finely rather closely punctured. Abdomen a little narrowed before the apex, the first four visible segments transversely impressed at the base and there coarsely and closely punctured, elsewhere finely and closely punctured.

Kamborangah, 7,200 feet, 26.3.29. A single specimen.

Remarkable on account of the abdominal puncturation and perhaps forms a new genus, but I am unable to observe the mouth parts satisfactorily.

Atheta (s. str.) borneensis sp. n.

Shining, black, the elytra yellow scarcely infuscate at the postero-external angles, abdomen pitchy, the apex of the last segment reddish-yellow. Antennæ black, the first three joints and the legs reddish-yellow. Length 2.75 mm.

Near *coriaria* Kr., and *dilutipennis* Motsch., but of narrower build with much more slender antennæ and shorter elytra than in either of these species. Head large, suborbicular, almost as wide as the thorax, very finely less closely punctured than in *dilutipennis*, eyes rather large. Antennæ slender, 2nd and 3rd joints subequal, 4th as long as broad, 5th slightly, 6th to 10th gradually more transverse, the penultimate joints about a half broader than long. Thorax a third broader than long, the posterior angles obtuse, before the scutellum with a small round impression, the sculpture as on the head. Elytra a little broader but scarcely longer than the thorax, not sinuate at the postero-external angles, as finely but a little more closely punctured, less closely than in *dilutipennis*. Abdomen very finely, moderately closely punctured, more sparingly behind.

Kenokok, 3,300 feet, 23.4.29. One specimen.

Atheta (s. str.) pendleburyi sp n.

Shining, black, the head, thorax and elytra with distinct brassy reflex. Antennæ black, the first two joints yellow. Legs yellow. Length 2.5 mm.

Somewhat similar to *coriaria* Kr., in size and build but with penultimate joints of the antennæ less transverse. Head suborbicular, narrower than the thorax, very finely, moderately closely punctured and with a fine indistinct coriaceous ground sculpture; eyes rather large. Antennæ with the 2nd and 3rd joints of equal length, 4th small, transverse, 5th to 10th more strongly transverse, gradually increasing in width. Thorax more than a third broader than long, convex, the posterior angles obtusely rounded, finely, moderately closely punctured and with ground sculpture as on the head. Elytra a third longer and a little broader than the thorax, scarcely sinuate postero-externally, very finely, closely, asperately punctured. Abdomen finely, moderately closely punctured except on the last three segments when the puncturation is much more sparing.

♂ : 7th dorsal segment in the middle near the posterior margin with a tubercle; 8th with six small teeth, the median pair separated from each other by a small arcuate emargination; 6th ventral segment a little produced, narrowed and rounded at apex.

Lumu Lumu, 5,500 feet, 10.4.29. One specimen.

Atheta (Dimetrota) aprilis sp. n.

Shining, black, the elytra yellow, scarcely infuscate at the postero-external angles. Antennæ black, the 1st joint reddish-yellow. Legs reddish-yellow. Length 4 mm.

In build somewhat resembling *insecta* Thoms., but with the temples bordered below, and the middle and posterior tibiæ with long setæ. it would appear to belong to the subgenus *Dimetrota.* Head round, narrower than the thorax, very finely, rather closely punctured and with a fine coriaceous ground sculpture; eyes large. Antennæ rather long, 2nd and 3rd joints of equal length, 4th to 7th scarcely longer than broad, 8th to 10th slightly transverse, 11th as long as the 9th and 10th together. Thorax a fourth broader than long, the sides almost straight, more retracted behind, the posterior angles obtusely rounded, very finely and indistinctly grooved along the middle, the sculpture as on the head. Elytra broader and a fourth longer than the thorax. Very finely and rather closely punctured. Abdomen nearly parallel, very finely, moderately closely punctured, more sparingly behind. Middle tibiæ with two, the posterior with three, long black setæ. The whole insect with a fine, moderately close pubescence.

♂ : 8th dorsal segment rounded; 6th ventral segment produced, narrowed and rounded at apex.

Kamborangah, 7,200 feet, 4.4.29. One specimen.

Atheta (Datomicra) morbida sp. n.

Build, size, colour and lustre of *sordidula* Er., but with the head, thorax and elytra less finely and not quite so closely, the abdomen rather more finely and distinctly less closely punctured and a little more narrowed behind. Tibiæ without distinct setæ. The antennæ as in *sordidula*.

Tenompok Pass, 4,200 feet, 18.3.29. One specimen.

Atheta (Acrotona) horrida sp. n.

Shining, black, the elytra yellowish-brown. Antennæ black, the first two joints yellowish. Legs yellow. Length 2.75 mm. Only differs from *peregrina* Kr., in the larger size, less closely punctured head and thorax and more finely punctured elytra. The antennæ are similarly constructed. The middle tibiæ have two, and the posterior one, long black setæ.

Tenompok Pass, 4,200 feet, 18.3.29. Two specimens.

Pelioptera quadrituberculata Cam.

Kenokok, 3,300 feet, 24.4.29. One specimen.

Pelioptera monticola sp. n.

Shining, black, the head and thorax with very slight violet reflex: elytra brownish-yellow. Antennæ black, the first joint brownish-yellow. Legs reddish-yellow. Length 4 mm.

Near *longicornis* Cam., but with narrower, less finely more distinctly punctured head and thorax, more slender but similarly constructed antennæ and less finely punctured elytra. Head subquadrate, narrower than the thorax, very finely, sparingly punctured; eyes large. Antennæ with the 2nd and 3rd joints of equal length, 4th to 10th slightly transverse, gradually increasing in width, 11th as long as the two preceding together. Thorax slightly transverse, the sides almost straight, a little retracted behind, the posterior angles rounded, finely, superficially, moderately closely punctured on the disc, much more sparingly towards the sides. Elytra about as long as the thorax, transverse, moderately closely, finely, more deeply and distinctly punctured than the fore-parts. Abdomen finely, sparingly punctured.

Kamborangah, 7,200 feet, 28.3.29. One specimen.

Astilbus intermedius sp. n.

Shining; head black, thorax brown or pitchy-black both with slight violet reflex: elytra blackish, lighter at the base;

abdomen brownish-yellow. Antennæ black, the first two joints and the legs reddish-testaceous. Length 4 mm.

Near *laevicauda* Bernh. and *borneensis* Cam.* From the former it differs in the larger size, longer darker antennæ, more finely punctured fore-parts, broader thorax and entirely brownish-yellow abdomen. From *aereus* Cam., it differs in the smaller size, narrower build, shorter thorax, lighter colour, less fine puncturation of the thorax and elytra; the antennæ are similarly constructed. In two of the specimens the thorax is broadly impressed in the middle of the posterior half and the 6th ventral segment a little produced; probably ♂ ♂.

Tenompok Pass, 4,200 feet, 18.11.29. Two specimens.

Tetrallus orientis sp. n.

Rather shining; head and abdomen black, thorax brown with the sides narrowly lighter; elytra yellow. Antennæ reddish-yellow, the last three joints infuscate. Legs reddish-yellow. Length 2 mm.

Somewhat resembling *Atheta orphana* Kr., in size and build but with the abdomen more narrowed. Head round, a good deal narrower than the thorax, with small, close, superficial somewhat umbilicate punctures; eyes large but not prominent. Antennæ rather short, the 3rd joint shorter than the 2nd, 4th about as long as broad, 5th to 10th transverse gradually increasing in width, the penultimate almost twice as broad as long, 11th stout, about as long as the 9th and 10th together. Thorax transverse (7:5) the sides evenly rounded, a little more retracted in front, the posterior angles rounded, on each side of the middle a little before the base with a small fovea, rather finely, moderately closely punctured and with fine coriaceous ground sculpture. Elytra slightly broader and nearly a third longer than the thorax, scarcely sinuate postero-externally, a little more finely and rather more closely punctured. Abdomen narrowed from base to apex, finely moderately closely punctured throughout.

♂ : 7th dorsal segment with a fine median keel in the posterior half; 8th with six small pointed teeth on the truncate posterior margin and traces of fine keels on the surface.

Kamborangah, 7,200 feet, 28.3.29. One specimen.

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* This name is preoccupied by Bernhauer 1915 and should be replaced by *aereus*.

XXIII. NEW MALAYAN BUPRESTIDAE, II.[*]

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This paper is the result of a study of a small collection of Buprestid Beetles received for identification from Mr. H. M. Pendlebury, Curator of the Selangor Museum, at Kuala Lumpur, Federated Malay States.

My sincere thanks are extended to Mr. Pendlebury for the privilege of studying this interesting collection of Buprestidae and for his kindness in permitting me to deposit the types of the new species in the United States National Museum Collection.

Iridotaenia monticola sp. n.

Rather narrowly navicular, strongly attenuate posteriorly, feebly convex, uniformly dark bronzy green above, with a feeble purplish tinge in certain lights, and moderately shining; head reddish cupreous in front but becoming greenish on the occiput and behind the eyes; antenna bluish black, except the three or four basal joints, which are dark green; pronotum with a vague aureous tinge on each side near the lateral margin; beneath golden green, with a vague cupreous reflection in certain lights, and the legs slightly more greenish.

Head broadly, deeply impressed in front, the depression extending from front of epistoma to the occiput, and laterally to the eyes, and with a deep, narrow, longitudinal groove in the middle of the depression on the front, the groove not extending to the epistoma or the occiput; surface nearly glabrous, coarsely, irregularly punctate, the punctures more or less confluent on the front, but becoming smaller and widely separated on the occiput; epistoma semicircularly emarginate in front, the surface coarsely, irregularly punctate, except at the middle, where it is smooth.

Pronotum strongly transverse, and slightly narrower at apex than at base; sides feebly, obliquely narrowed from base to apex, vaguely expanded at base; anterior margin and base nearly transversely truncate, at most only feebly sinuate; disk feebly, uniformly convex, with a vague narrow, longitudinal, median groove extending from base to middle of pronotum; surface vaguely granulose, rather densely, very finely, regularly punctate, with numerous coarse, irregularly distributed punctures intermixed, the coarse punctures more or less confluent toward the sides. Scutellum small, elongate, and broadly expanded posteriorly.

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[*] I. Journ. F. M. S. Museums, vol. XVI, 1930, pp. 25–57.

Elytra slightly wider than pronotum at base; sides broadly expanded behind the humeral angles, then arcuately narrowed (strongly, irregularly dentate posteriorly) to the tips, each of which terminates in a small sutural spine; each elytron with a vague, narrow, longitudinal depression along the sutural margin toward the apex, and the surface coarsely but not deeply, irregularly punctate, the punctures more or less confluent, causing the surface to be feebly rugose.

Abdomen beneath sparsely, irregularly punctate at the middle, finely, densely punctate toward the sides, and rather densely clothed with short, semierect, whitish pubescence; first sternite feebly flattened at the middle; last sternite strongly narrowed to the apex, which is broadly, deeply, angularly emarginate. Prosternal process flat, and very sparsely, coarsely punctate.

Length, 24 millimeters; width, 6.5 millimeters.

Type locality.—Larut Hills, Perak, Federated Malay States.

Type.—United States National Museum.

Described from a unique male collected at the type locality at an elevation of 4,500 feet, February 22, 1932, by H. M. Pendlebury.

This species is closely allied to *Iridotaenia insularis* Fisher, but it differs from that species in being narrower, the longitudinal groove on the front of the head deeper and longer, the sides of the pronotum obliquely narrowed from the base to the apex, and the surface without a depressed cupreous spot on each side near the lateral margin, and the first abdominal sternite not gibbose between the posterior coxae.

Lampra perakensis sp. n.

Elongate, subcylindrical, and moderately shining; head bronzy green, with a feeble cupreous tinge, and ornamented with black spots as follows: A large triangular spot on the front, narrowly connected to an oblong spot on the occiput, and a small spot on each side near the lateral margin; pronotum reddish cupreous, with eight or ten small, irregular shaped black spots, two placed longitudinally at the middle, and four on each side of the middle (only two of the spots distinct on the one side); elytra reddish cupreous, and ornamented with numerous small, irregular shaped black spots; beneath dark green, with a distinct golden and bluish tinge in certain lights.

Head with the front broadly, strongly elevated behind the epistoma, deeply depressed around the bases of the antennae, one-fourth wider at the bottom than at the top, the lateral margins feebly, obliquely narrowed from bottom to top, and with a narrow, longitudinal, median groove on the occiput; surface sparsely clothed with a few inconspicuous hairs, coarsely, confluently punctate, except on the black areas where the surface is nearly smooth, the punctures large, round, very shallow, with the margins sharply defined.

Pronotum nearly two times as wide as long, distinctly wider at base than at apex, and widest at middle; sides arcuately rounded from apical angles to just behind the middle, then nearly parallel to the posterior angles, which are nearly rectangular; anterior margin feebly, arcuately emarginate, without a distinct median lobe; base strongly bisinuate, with the median lobe broadly subtruncate, and strongly produced; disk moderately, uniformly convex; surface nearly glabrous, finely, densely granulose, coarsely, confluently alveolate-punctate, except on the black spots. Scutellum small, and strongly transverse.

Elytra slightly wider than pronotum, and broadly rounded at humeral angles; sides nearly parallel to behind the middle (broadly, vaguely constricted in front of middle), then obliquely narrowed to the tips, which are separately, narrowly rounded, strongly serrate, and the serration extending forward along the lateral margins to near the middle; disk strongly, uniformly convex, with a few vague depressions at the base; surface distinctly stria-punctate, the intervals finely, densely granulose, more or less rugose, and sparsely clothed with short, inconspicuous, white hairs.

Abdomen beneath rather densely, coarsely punctate, except at the sides of the basal sternites, the punctures shallow, oblong, open posteriorly, and distinctly separated from each other, and the surface sparsely clothed with short, semierect, inconspicuous, white hairs; last sternite deeply, semicircularly emarginate at the apex, and produced into a long, acute spine on each side of the emargination. Prosternum flat, deeply, narrowly grooved along the anterior margin, very coarsely, confluently punctate, and nearly glabrous.

Length, 9.5 millimeters; width, 3.5 millimeters.

Type locality.—Larut Hills, Perak, Federated Malay States.

Type.—United States National Museum.

Described from a single specimen (sex not determined) collected at the type locality at an elevation of 3,700 to 4,500 feet, February 13, 1932, by H. M. Pendlebury.

This species resembles *Lampra pubescens* Fisher, but it differs from that species in being more cupreous, with different arrangement of the black spots on the head and pronotum, the intervals between the striae on the elytra more strongly convex, and the surface not distinctly pubescent. It also resembles *Lampra semperi* Saunders, but differs from it in being more elongate and slender, with the pronotum ornamented with black spots.

Lampra pendleburyi sp. n.

Elongate, subcylindrical, and feebly shining; head olivaceous green, with a distinct brownish or purplish tinge; pronotum aeneo-cupreous, with the elevations more or less purplish; elytra reddish cupreous, and irregularly ornamented with numerous small, irregular, inconspicuous, dark spots; beneath dark bronzy green, with a distinct brownish or purplish tinge in certain lights.

Head with the front strongly elevated behind the epistoma, deeply depressed around the bases of the antennae, one-half wider at the bottom than at the top, the lateral margins strongly, obliquely narrowed from bottom to top, broadly but not deeply concave behind the epistoma, and with a narrow, longitudinal groove on the vertex and occiput; surface rather densely, coarsely, irregularly punctate, and sparsely clothed with a few inconspicuous hairs.

Pronotum twice as wide as long, distinctly wider at base than at apex, and widest in front of middle; sides arcuately rounded from apical angles to near the middle, than feebly, obliquely narrowed to the posterior angles, which are nearly rectangular; anterior margin feebly, arcuately emarginate, without a distinct median lobe; base strongly bisinuate, with the median lobe broadly rounded and rather strongly produced; disk moderately convex, more or less uneven, and with a broad, moderately deep, median depression extending from anterior margin to near the base; surface vaguely granulose, coarsely, irregularly punctate, the punctures more or less confluent toward the sides, and sparsely clothed with short, inconspicuous hairs. Scutellum small, and strongly transverse.

Elytra slightly wider than pronotum, and broadly rounded at the humeral angles; sides nearly parallel to behind the middle (broadly, vaguely constricted in front of middle), then arcuately narrowed to the tips, which are separately, narrowly rounded, strongly serrate, and the serration extending forward along the lateral margins to near the middle; disk strongly, uniformly convex, with a few vague depressions at the base; surface distinctly stria-punctate, the intervals feebly convex, finely, densely granulose, sparsely, irregularly punctate, becoming more or less rugose toward the sides, and sparsely clothed with short, inconspicuous hairs.

Abdomen beneath rather densely, finely punctate, and sparsely clothed with short, semierect, inconspicuous hairs; last sternite broadly, rectangularly emarginate at the apex, and produced into a long, acute spine on each side of the emargination. Prosternum nearly flat, feebly depressed along the anterior margin, very coarsely, confluently punctate, and nearly glabrous.

Length, 12 millimeters; width, 4.5 millimeters.

Type locality.—Bukit Kutu, Selangor, Malay Peninsula.

Type.—United States National Museum.

Described from a unique specimen (sex not determined) collected at the type locality at an elevation of 3,500 feet, March 21, 1931, by H. M. Pendlebury.

This species differs from *Lampra perakensis* Fisher in being more robust, without any distinct black spots on the head and pronotum, and the latter with a broad median depression extending from the anterior margin to near the base.

Anthaxia kedahae sp. n.

Elongate, slightly attenuate posteriorly, feebly shining; above olivaceous brown, with a strong aeneous tinge, the head bright green in front, pronotum with the apical angles slightly greenish, a narrow green band along base of elytra, and the sutural region of each elytron more less greenish; beneath piceous, with a feeble aeneous tinge, and the legs more or less greenish.

Head large, as wide as pronotum at anterior margin; front flat, broadly, vaguely depressed, the distance between the eyes equal to twice the diameter of each eye when viewed from the front, the lateral margins nearly parallel from base to occiput, where they are strongly converging; surface densely, coarsely ocellate-punctate; eyes rather large, and feebly projecting; epistoma small, transverse, and broadly arcuately emarginate in front.

Pronotum twice as wide as long, base and apex subequal in width, and widest at middle; sides strongly, arcuately rounded; anterior margin deeply, arcuately emarginate, with a feeble, broadly rounded median lobe; base transversely truncate; disk feebly convex, with a broad, shallow depression near the posterior angles; surface densely, coarsely ocellate-punctate. Scutellum ogivaliform, flat, and finely, transversely rugose.

Elytra as wide as pronotum at base; sides nearly parallel from base to middle, then arcuately narrowed to the tips, which are separately, narrowly rounded, and moderately convex; humeri rather prominent; each elytron with a narrow, deep depression along the base, a vague, transverse depression at basal third along the sutural margin, a short, deep groove between the humerus and lateral margin, and a broad, shallow depression behind the humerus; surface finely, densely rugose, and sparsely clothed with short, inconspicuous hairs.

Abdomen beneath feebly ocellate-punctate, and sparsely clothed with short, inconspicuous hairs; last sternite broadly rounded at apex. Prosternum coarsely, densely ocellate-punctate; prosternal process rather narrow, flat, and ocellate-punctate.

Length, 3.4 millimeters; width, 1.4 millimeters.

Type locality.—Bukit Panchor, Kedah, Malay Peninsula.

Type.—United States National Museum.

Described from a single male specimen collected at the type locality, June 4, 1930, by H. T. Pagden.

This species resembles *Anthaxia mindanaoensis* Fisher, but it differs from that species in having the head in front narrowly, feebly depressed, and of a bright green color, pronotum without cupreous spots near the posterior angles, the scutellum ogivaliform, and the elytra more densely rugose.

Aphanisticus pendleburyi sp. n.

Elongate, moderately convex; head and pronotum slightly aeneous; elytra black, shining; beneath black, shining, the legs with a vague aeneous reflection in certain lights, and the tarsal lamellae brownish white.

Head elongate, distinctly wider posteriorly, and much narrower than the pronotum; front broadly but not very deeply depressed between the eyes, with a small, round gibbosity on each side of the depression at anterior margin, and the lateral margins vaguely constricted at middle; eyes not acutely margined on the inner side nor projecting forward; surface finely, vaguely granulose, with a few inconspicuous punctures intermixed.

Pronotum nearly twice as wide as long, distinctly wider at base than at apex, and widest just behind the middle; sides arcuately rounded from base to apex, more strongly anteriorly, and the margins feebly crenulate; posterior angles sharply defined and rectangular; anterior margin broadly, deeply, arcuately emarginate, with a vague, broadly rounded median lobe; base bisinuate, with the median lobe broadly rounded, and strongly, abruptly produced; disk moderately convex, broadly flattened toward the sides, narrowly flattened along the base, with a deeper depression on each side near the posterior angles, and the median convexity with a shallow, transverse depression just behind the middle, and a similar triangular depression along the anterior margin; surface finely, vaguely granulose, with a few coarse, inconspicuous punctures intermixed in the flattened area on each side. Scutellum very small and triangular.

Elytra a little wider than pronotum at base; humeral angles acutely angulated; sides sinuate along basal halves, obliquely narrowed from middle to the tips, which are separately, broadly rounded; humeri not prominent, limited posteriorly by a broad, deep depression along the lateral margins, causing the side margins to be slightly flattened along the basal third; surface without longitudinal costae, slightly uneven, finely, vaguely granulose and transversely rugose, and with indistinct rows of long, very narrow, vague punctures.

Abdomen beneath glabrous, finely, vaguely reticulate, with a few very shallow, vague, oblong punctures intermixed. Prosternum with the anterior margin deeply, broadly, arcuately emarginate.

Length, 3.6 millimeters; width, 1.5 millimeters.

Type locality.—Larut Hills, Perak, Federated Malay States.

Type.—United States National Museum.

Described from a single specimen (sex not determined) collected at the type locality at an elevation of 3,700 to 4,500 feet, February 24, 1932, by H. M. Pendlebury. The type has been pinned with a minute nickel pin, and the right elytron is missing.

This species is allied to *Aphanisticus excavatus* Fisher, but it differs from that species in having the head shorter, the depression between the eyes more shallow, with a small, round gibbosity on each side at the anterior margin, the eyes not acutely angulated on the inner margins nor projecting forward, and the pronotum regularly, arcuately rounded at the sides.

Trachys perakae sp. n.

Broadly cuneiform, similar to *Trachys lepidoptera* H. Deyrolle; above aeneous, strongly shining, and irregularly clothed with long, semierect, pale yellow and whitish pubescence, the whitish hairs forming more or less distinct, transverse, zigzag fasciae on the elytra; beneath piceous, with a strong aeneous tinge.

Head large, the front broadly, deeply concave between the eyes, with a narrow median groove extending from the occiput to the epistoma, the two median postoral pores small and widely separated; surface feebly, irregularly ocellate-punctate, and sparsely clothed with long, semierect, whitish hairs, except for a transverse spot on the vertex where the surface is glabrous and vaguely reticulate; eyes rather strongly margined on the inner sides, and moderately converging toward the bottom; epistoma strongly transverse, and very narrow between the antennae, the anterior margin broadly, transversely truncate, and the surface feebly, transversely reticulate; clypeal suture distinct, and broadly transverse.

Pronotum three times as wide as long at middle, much narrower at apex than at base, and widest at base; sides strongly, arcuately narrowed from base to apical angles, vaguely sinuate near the base; apical angles acute and forming an arc with the front of the eyes; posterior angles produced slightly backward; anterior margin broadly, deeply, arcuately emarginate; base strongly, transversely sinuate, with the median lobe broadly rounded and strongly produced; disk feebly convex, slightly flattened toward the lateral margins, which are slightly elevated posteriorly, and with a large, round, deep depression on each side near the apical angle; surface rather densely ocellate-punctate, and moderately clothed with long, semierect, pale yellow and whitish hairs intermixed. Scutellum small and triangular.

Elytra slightly wider than pronotum at base, and widest at base; sides strongly, obliquely narrowed from base to apical fifth, then arcuately narrowed to the tips, which are conjointly, broadly rounded; humeri moderately prominent; each elytron with a distinct lateral carina extending from the humerus to near the apical margin, with a broad basal depression, and a similar depression along the lateral margin behind the humerus; surface sparsely, finely punctate, more or less rugose, and rather densely, irregularly clothed with long, semierect, pale yellow and whitish hairs intermixed, the whitish hairs forming more or less distinct, transverse, zigzag fasciae.

Beneath rather strongly convex; abdomen vaguely granulose, feebly, rather densely ocellate-punctate, and sparsely clothed with short, recumbent, white hairs toward the sides. Prosternum slightly declivous anteriorly, the anterior margin broadly rounded, the surface finely granulose, and clothed with a few recumbent hairs; prosternal process distinctly elevated, subequal in length and width, distinctly narrower at base than at apex, the sides obliquely expanded to the apex, which is broadly rounded, and the surface sparsely ocellate-punctate. Tarsi and tarsal claws piceous, with a distinct aeneous tinge, tarsal lamellae whitish.

Length, 4 millimeters; width, 2.4 millimeters.

Type locality.—Larut Hills, Perak, Federated Malay States.

Type.—United States National Museum.

Described from a single specimen (sex not determined) collected at the type locality at an elevation of 3,700 to 4,000 feet, February 12, 1932, by H. M. Pendlebury.

This species is very closely allied to *Trachys lepidoptera* H. Deyrolle, but it differs from that species in having the pubescence on the upper surface paler, and the transverse, zigzag fasciae on the elytra composed of whitish hairs.

Agrilus langkasukae sp. n.

Female.—Form rather large, elongate, and moderately attenuate posteriorly; head aeneous, with a distinct purplish tinge in front, becoming dark bronzy green on the occiput; pronotum greenish black, with the sides aeneous; elytra aeneous, becoming more or less bluish posteriorly (surface may be discolored), and each elytron ornamented with a rather broad, inconspicuous, longitudinal, pubescent vitta; beneath aeneous, with a feeble cupreous reflection in certain lights.

Head with the front rather wide, slightly convex, slightly wider at bottom than at top, the lateral margins feebly, arcuately expanded at vertex, obliquely expanded at bottom, and with a broad, shallow depression on the vertex; surface coarsely, irregularly punctate, coarsely rugose, the rugae transverse on the front and longitudinal on the occiput, and sparsely clothed along the eyes and behind the epistoma with rather long, semierect, white hairs; epistoma strongly transverse between the antennae, flat, vaguely, arcuately emarginate in front, and the surface densely granulose; antennae extending to the basal fourth of the pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes rather large, oblong, and equally rounded above and beneath.

Pronotum nearly one-third wider than long, distinctly wider at apex than at base, and widest near the apex; sides obliquely narrowed from near the apical angles to the posterior angles, which are rectangular; when viewed from the side the marginal and submarginal carinae are strongly sinuate, rather widely separated anteriorly, and connected to each other near the base; anterior margin strongly sinuate, the median lobe broadly rounded and strongly produced; base arcuately emarginate at the middle of each elytron, with the median lobe broadly rounded, and vaguely arcuately emarginate in front of the scutellum; disk moderately convex, broadly flattened toward the sides posteriorly, and with strongly elevated, arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins at middle; surface finely, closely, transversely rugose, and rather sparsely, finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and subequal in width at base and behind the middle; sides feebly expanded behind the base, broadly, arcuately constricted in front of middle, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are separately, narrowly rounded, and irregularly serrate; sides of abdomen feebly exposed above; disk feebly convex, the sutural margins slightly elevated posteriorly, and with broad, moderately deep, basal depressions; surface densely, finely scabrous or granulose, and each elytron ornamented with a rather broad, inconspicuous vitta of sparsely, irregularly distributed, short, white hairs, extending from basal depression to apex.

Abdomen beneath feebly granulose, sparsely, finely scabrous or rugose on basal sternites, becoming sparsely, finely punctate on the apical sternites, and very sparsely clothed with short, semierect, white hairs; first and second sternites convex, without a groove at the middle; vertical portions of the segments not conspicuously pubescent; pygidium strongly, longitudinally carinate, the carina broad, projecting, and emarginate at apex. Prosternum rather densely, coarsely scabrous, and sparsely clothed with short, recumbent, white hairs; prosternal lobe broad, slightly declivous, and broadly, arcuately emarginate in front; prosternal process broad, feebly expanded behind the coxal cavities, and transversely truncate at the apex, with a triangular tooth at the middle. Tibiae slender, straight, and unarmed at apices. Posterior tarsus about one-half as long as the tibia, and the first joint as long as the following joints united. Tarsal claws similar on all feet, cleft near the middle, the inner tooth broad, much shorter than the outer one, and not turned inward.

Length, 7.6 millimeters; width, 2 millimeters.

Type locality.—Bukit Panchor, Kedah, Malay Peninsula.

Type.—United States National Museum.

Described from a unique female collected at the type locality, July 8, 1929, by H. T. Pagden.

This species is allied to *Agrilus singaporensis* Obenberger, but it differs from that species in coloration, in having the head flat in front, the epistoma vaguely, arcuately emarginate in front, the white hairs irregularly distributed on the longitudinal vittae on the elytra, and the pygidium with a projecting carina.

This species is named after Langkasuka, the ancient name for Kedah.

Agrilus tahanae sp. n.

Male.—Form rather short and slender; head nile green in front, becoming aeneous on the occiput; pronotum aeneous; elytra purplish black, and each elytron with the median part of the basal half olivaceous green, and ornamented with a rather broad, inconspicuous, longitudinal, pubescent vitta; beneath black, with a distinct greenish or aeneous tinge.

Head with the front rather wide, flat, about equal in width at bottom and top, the lateral margins broadly, feebly, arcuately emarginate on the front, and with a rather broad, shallow, longitudinal depression on the vertex and occiput; surface densely, finely granulose, sparsely, coarsely punctate, feebly, transversely rugose on the front, strongly, longitudinally rugose on the occiput, and clothed along the eyes and behind the epistoma with a few long, semierect, white hairs; epistoma slightly transverse between the antennae, strongly elevated, transversely truncate in front, and the surface densely, finely granulose; antennae extending to basal fourth of the pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes rather large, oblong, and about equally rounded above and beneath.

Pronotum one-third wider than long, slightly wider at apex than at base, and widest just in front of middle; sides feebly, arcuately rounded from apical angles to behind the middle, then more strongly narrowed to near the posterior angles, where the sides are nearly parallel; when viewed from the side the marginal carina is slightly sinuate, the submarginal carina nearly straight, the two carinae rather narrowly separated anteriorly, and connected to each other at the base; anterior margin sinuate, the median lobe broadly rounded, and strongly produced; base rather acutely emarginate at middle of each elytron, with the median lobe broadly rounded, and broadly, feebly, arcuately emarginate in front of the acutellum; disk moderately convex, vaguely, broadly depressed along the anterior margin, a rather broad depression on each side extending obliquely backward to a broad, concave depression along the base, the depression slightly deeper in front of the scutellum, and with strongly elevated, arcuate, prehumeral carinae, which extend from near the posterior angles forward to near the lateral margins at middle; surface finely, rather closely, transversely rugose, and rather sparsely, finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and subequal in width at base and behind the middle; sides nearly parallel behind the base, broadly, arcuately constricted in front of middle, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are separately, narrowly rounded, and strongly serrate; sides of abdomen broadly exposed above; disk moderately convex, the sutural margins slightly elevated posteriorly, and with broad, moderately deep, basal depressions; surface densely, finely imbricate-punctate, sparsely, uniformly clothed with short, inconspicuous hairs, and each elytron ornamented with a rather broad, inconspicuous vitta of sparsely, irregularly distributed, short, white hairs, extending from the basal depression to near the apex.

Abdomen beneath finely, sparsely punctate, vaguely reticulate, scabrous on basal sternite, and sparsely, uniformly clothed with short, recumbent, white hairs; first and second sternites longitudinally concave at middle; vertical portions of the segments not conspicuously pubescent; pygidium acutely angulated at apex, feebly, longitudinally carinate, but the carina not projecting. Prosternum rather densely, finely scabrous, and sparsely, longitudinally clothed at the middle with long, erect, inconspicuous hairs; prosternal lobe broad, strongly declivous, and broadly subtruncate or vaguely emarginate in front; prosternal process broad, the sides parallel to behind the coxal cavities, then strongly narrowed to the apex, which is acute. Tibiae slender, straight, and the anterior pair armed with a short, inconspicuous tooth on the inner margin at apices. Posterior tarsus one-half as long as the tibia, and the first joint as long as the following joints united. Tarsal claws similar on anterior and middle feet (claws on posterior tarsi missing), cleft near the middle, teeth slender, the inner tooth slightly shorter than the outer one, and not turned inward.

Length, 4.8 millimeters; width, 1.25 millimeters.

Type locality.—Bukit Panchor, Kedah, Malay Peninsula.

Type.—United States National Museum.

Described from a single male collected at the type locality, June 4, 1930, by H. T. Pagden.

This species is allied to *Agrilus malasicus* Fisher, but it differs from that species in having the pronotum aeneous, the longitudinal vitta on each elytron not conspicuous, and the tips of the elytra narrowly rounded and strongly serrate.

This species is named after Gunong Tahan, the highest mountain in the Malay Peninsula.

Agrilus pagdeni sp. n.

Male.—Form rather short and slender; head bluish green in front, slightly aeneous behind the epistoma, and becoming purplish black on the occiput; pronotum and elytra olivaceous brown, and the latter ornamented with inconspicuous, yellowish pubescent markings; beneath aeneous, with a vague cupreous tinge.

Head with the front rather narrow, flat, slightly wider at top than at bottom, the lateral margins strongly, broadly, arcuately emarginate on the front, and with a rather broad, shallow depression on the vertex and occiput; surface finely, densely granulose, sparsely, coarsely punctate, feebly, transversely rugose on the front, strongly, longitudinally rugose on the occiput, and densely clothed behind the epistoma with long, recumbent, golden yellow hairs; epistoma slightly transverse between the antennae, strongly elevated, transversely truncate in front, and the surface finely, densely granulose and sparsely pubescent; antennae extending nearly to base of pronotum, serrate from the fourth joint, and the outer joints slightly longer than wide; eyes large, oblong, and more acutely rounded beneath than above.

Pronotum slightly wider than long, slightly wider at apex than at base, and widest near the apex; sides feebly, arcuately narrowed from the apical angles to the posterior angles, which are rectangular; when viewed from the side the marginal carina is strongly sinuate, the submarginal carina feebly sinuate, the two carinae broadly separated anteriorly, and connected to each other at the base; anterior margin strongly sinuate, the median lobe strongly rounded, and moderately produced; base bisinuate, with the median lobe broadly rounded, feebly produced, and subtruncate in front of scutellum; disk moderately convex, broadly, vaguely, transversely concave along the base, broadly flattened toward the sides posteriorly, and with strongly elevated, slightly arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins at middle; surface finely, but not very closely, irregularly rugose, the rugae more or less arcuate anteriorly, rather sparsely punctate between the rugae, and sparsely clothed with short, inconspicuous hairs. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and subequal in width at base and behind the middle; sides feebly expanded behind the base, broadly, arcuately constricted in front of middle, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are separately, narrowly rounded, and vaguely serrate; sides of the abdomen broadly exposed above; disk moderately convex, the sutural margins feebly elevated behind the middle; and with broad, moderately deep, basal depressions; surface densely, rather coarsely imbricate-punctate, sparsely, uniformly clothed with short, erect, inconspicuous hairs, and each elytron ornamented with a broad vitta of uniformly distributed, short, yellowish hairs, the vitta extending along the sutural margin from the base to behind the middle where it is expanded into a large, round spot; there is also an elongate spot of similar hairs along the sutural margin near the apex.

Abdomen beneath feebly granulose, sparsely, finely punctate, slightly scabrous on basal sternites, and very sparsely, uniformly clothed with short, recumbent, white hairs; first and second sternites vaguely flattened at the middle; vertical portions of the first segment slightly more conspicuously pubescent than the other segments; pygidium acutely angulated at apex, feebly, longitudinally carinate, but the carina not projecting. Prosternum sparsely, finely scabrous, sparsely clothed with moderately long, recumbent, white hairs; prosternal lobe broad, slightly declivous, and broadly, arcuately rounded in front; prosternal process broad, feebly concave, the sides slightly expanded behind the coxal cavities, then strongly, obliquely narrowed to the apex, which is acute. Tibiae slender, straight, and the anterior and middle pairs armed with a long tooth on the inner margin at apices. Posterior tarsus three-fourths as long as the tibia, and the first joint as long as the following joints united. Tarsal claws dissimilar, anterior and middle claws cleft near the middle, the teeth slender, the inner tooth slightly shorter than the outer one, and not turned inward; posterior claws cleft near the middle, with the inner tooth broad and very short.

Length, 5 millimeters; width, 1.3 millimeters.

Type locality.—Bukit Panchor, Kedah, Malay Peninsula.

Type.—United States National Museum.

Described from a single male collected at the type locality, June 4, 1930, by H. T. Pagden.

This species resembles *Agrilus tahanae* Fisher, but it differs from that species in having the head densely clothed behind the epistoma with long golden yellow hairs, and in having a different arrangement of the pubescent markings on the elytra.

XXIV. DESCRIPTION DE QUELQUES NOUVEAUX CERCOPIDES MALAIS.

Par le DR. V. LALLEMAND (*Uccle*).

Callitettix costalis sp. n.

Tête noire, éxtremité du clypeus et article basal du rostre ocre-jaune; pronotum brun-noir, montrant de chaque côté, le long du bord externe, une bande jaune; écusson jaune; élytres brun-noir, sauf: 1°) la partie comprise entre le radius et le bord externe qui est d'abord jaune près de la base, puis brun noir sur un court espace et enfin hyaline jusqu'à la partie apicale; 2°) une étroite bande d'un jaune plus ou moins brunâtre, partant de la base et située entre la commissure et la première nervure du clavus; 3°) on niveau de la pointe de ce dernier entre la branche interne du radius et le mediane une tache blanche ovale; ailes enfumées; pro- et mésosternum noirs ou noir brunâtre sauf les bords latéraux jaunes; metasternum ocre; abdomen brun plus ou moins foncé; toutes les cuisses, et tibias antérieurs et médianes noirs, plus ou moins ocre jaune vers le base; tibias postérieurs blanc-jaunâtre, à éxtremité noire, la pointe de leur épine est également noire; tarses noirs. La surface supérieure de l'insecte est récouverte d' une villosité rousse fort dense.

Longueur: 8.5 mm.

Perak: Batang Padang, Jor Camp 1,800 feet, March 1924 (H. M. Pendlebury).

Genus **Pseudeoscarta** gen. n.

Tête globuleuse, la longueur de la partie supérieure de celle-ci est égale à environ deux fois celle d'un des yeux, et à la distance entre ceux-ci; le bord antérieur est en angle arrondi; ocelles petits, très proches d'un de l'autre; front sans fossette ni carène médiane, à faibles striés latérales. vu de côté, il est bombé; pronotum ponctué en stries transversales à faible ligne médiane longitudinale, à bord postérieur concave; écusson à grande fossette médiane, vers la base des élytres le médian et le cubitus se réunissent sur un court trajet, puis se séparent de nouveau, radius bifurqué en arrière du milieu, à la partie apicale quatre grandes cellules, la branche interne du radius et le mediane se bifurquent tout-à-fois à leur éxtremité en formant deux ou trois petites cellules incluses dans les précédentes; neuration des ailes pareille à celle des *Eoscarta;* sur les tibias postérieurs une épine.

Très proche du genre *Eoscarta* s'en distingue seulement par l'absence de sillon longitudinal frontal. Le type du genre:

Pseudeoscarta pendleburyi sp. n.

Ocre; sauf les ocelles, les yeux, l'article basal des antennes, l'éxtremité des tarses et des épines brun-noir; partie apicale des élytres bordée plus ou moins largement de rose, depuis l'éxtremité du clavus jusqu'au même niveau au bord externe.

Longueur: 6 mm.

Selangor: Bukit Kutu 3,300 feet. Perak: Larut Hills 3,700 feet, February 1932 (H. M. Pendlebury); Gunong Kledang, 2,000 feet (E. Seimund).

Eoscarta nigrovittata sp. n.

Ocre, sauf une bande longitudinale noire occupant le milieu du vertex et du front; yeux, éxtremité des épines et des griffes noirs; une large bande rose long le bord des elytres depuis l'éxtremité du clavus et s'étend jusqu'au milieu du bord externe. Front non tectiform à fossette large, profonde, voisine du bord antérieur de la tête; pronotum strié transversalement; sur l'écusson une grande fossette; sur les élytres quatre grandes cellules apicales.

Longueur: 10 mm.

Pahang: Fraser's Hill 4,000 feet (H. M. Pendlebury). Perak.

Keduscarta seimundi sp. n.

Vertex et sillon longitudinal du front rouge légèrement brunâtre, côtés de front brun-noir, yeux noirs; corps ocre brun clair, abdomen plus foncé; pronotum, écusson ocre brun, plus foncé par places; élytres de coloration assez confuse, et à teintes mélangées, brun-noir, ocre brun par places principalement sur la moitié basale du clavus et sur le quart basal du bord externe, à la partie postérieure trois taches rouge carmin, une près de l'éxtremité du clavus, la deuxième au bord externe en face de la première, et la dernière au milieu, en arrière des deux précédentes, non loin du bord postérieur, des trois taches la mieux franchée est celle située près du bord externe, la teinte rouge peut quelquefois envahir l'éxtremité du clavus. Toute la surface supérieure est recouverte d'une villosité rousse, très dense. Front tectiform, vu de côté, brisé en angle obtus, à sillon median long et assez étroit s'étendant jusqu'à la brisure; nervures des élytres peu saillantes.

Longueur: 8 mm.

Perak: Gunong Kledang, 2,000 feet (E. Seimund). North Borneo: Bettotan, near Sandakan (C. Boden Kloss and H. M. Pendlebury).

[For previous papers by Dr. Lallemand on Malaysian Cercopidae see *antea* pp. 170–178 (1932). *H.M.P.*]

XXV. NOTES AND NEW RECORDS OF BUTTERFLIES FROM THE MALAY PENINSULA.

By H. M. PENDLEBURY.

Considerable additions have been made to the butterfly fauna of the Malay Peninsula in the course of general collecting during the last twelve years or so. The number of species recorded already is seven hundred which includes several of the recently discovered Hesperiidae mentioned by Brigadier W. H. Evans C.S.I., C.I.E., D.S.O., in his handbook, "Identification of Indian Butterflies" (Second Edition. 1932).

In this report (new records marked *), and in the two papers that follow (one by the writer and Dr. A. S. Corbet, and the other by Brigadier W. H. Evans), one hundred and one further species belonging to various families are added bringing the total to eight hundred and one, and it is anticipated that a critical study and revision of certain genera, especially in the Lycaenidae, may increase this figure appreciably. Seven new records of Hesperiidae are given herein by Brigadier Evans on revising the list of Malayan species.

The distribution of butterflies among the various families, including the species now recorded for the first time, is as follows:—

Family.	Recorded.	New Records.	Total.
Papilionidae	43.	1.	44.
Pieridae	42.	6.	48.
Danaidae	34.	2.	36.
Satyridae	40.	9.	49.
Amathusiidae	22.	3.	25.
Nymphalidae	126.	14.	140.
Erycinidae	15.	2.	17.
Lycaenidae	203.	57.	260.
Hesperiidae	175.	7.	182.
Totals	700.	101.	801.

These figures represent the number of species only, and do not include varieties, forms, or isolated races. Several of the small islands off the coast of the Peninsula (*e.g.* Pulau Tioman, Pulau Aor, Pulau Perhentian, etc.) yield races that are distinct from those of the mainland; the Langkawi Islands off the coast of Perlis produce several species found only in Peninsular Siam and northwards. Some of the more striking insular races have been described already [1], and six others are detailed below (marked †). Besides new records there are comments on fifteen other species.

Grateful thanks are extended to Brigadier W. H. Evans for the immense amount of trouble he has taken over the Lycaenidae and Hesperiidae; to Dr. K. Jordan, F R.S., Director of the Zoological Museum, Tring, for comparing certain species and indicating racial distinctions; to Captain N. D. Riley, of the Natural History Museum, South Kensington; and especially to Dr. A. S. Corbet for his constant help, gifts of specimens, and notes on the remarkably complete collection of butterflies he made during his stay of a little more than four years in this country. Valuable assistance has been given also by the Rev. Father R. Cardon, Messrs. J. E. Kempe and E. M. Hayward by the gift or loan of specimens, notes, and by allowing me to examine collections they have made. Some interesting species have been taken also by Mr. G. C. Stubbs who has been collecting only during the last two years. He has made a very successful start by capturing several rarities which include *Papilio agestor*, *Lethe sinorix*, and *Sephisa chandra*.

Some of Mr. Hayward's surprising discoveries call for special mention, as during the last three years he has found in Perak four species that were regarded as exclusively Philippine. These are: *Cepora boisduvaliana* Feld., *Appias nephele* Hew., *Ergolis taeniata* Feld., and *Tanaecia calliphorus* Feld. If they had been taken at a seaport the inference would be obvious, but in point of fact all are recorded from places well inland: *A. nephele* and *E. taeniata* came from the neighbourhood of the recently completed Chenderoh Dam, *Tanaecia calliphorus* occurred in a tin mining area, and several specimens were seen. Both these localities suggest that they might have been imported with produce, but *C. boisduvaliana* is said to be established on the heavily wooded lower slopes of Gunong Kledang, near Ipoh. It will be interesting to see later on whether these are to be regarded as accidental intruders or as settled inhabitants of the country.

SYSTEMATIC.

In this paper the following species and subspecies are described as new:—

Delias belladonna malayana ssp. n. Pahang, page 380
Cepora lea aora ssp. n. Pulau Aor, page 381
Ixias ludekingi alticola ssp. n. Pahang, page 383.
Ypthima pandocus tahanensis ssp. n. Pahang, page 384.
Lethe verma robinsoni ssp. n. Pahang, page 386.
Faunis taraki sp. n. Pahang, page 389.

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[1] Moulton, Journ. Malayan Br. Royal Asiat. Soc., i, 1923, pp. 233–236.

Enispe euthymius corbeti ssp. n. Selangor, page 390.
Cynthia erota tiomana ssp. n. Tioman Island, page 391.
Cyrestis periander robinsoni ssp. n. Tioman Island, page 393.
Cyrestis periander klossi ssp. n. Perhentian Islands, page 394.
Chersonesia rahria tiomana ssp. n. Tioman Island, page 394.
Neptis columella parvimacula ssp. n. Tioman Island, page 395.
Pantoporia ranga malaya ssp. n. Selangor, Pahang, page 395.
Eriboea eudamippus peninsularis ssp. n. Perak, page 398.
Tajuria larutensis sp. n. Perak, page 400.
Catapaecilma subochrea evansi ssp. n. Selangor, page 401.

Family PAPILIONIDAE.

* Papilio agestor agestor Gray.

Papilio agestor Gray, Zool. Misc., 1832, p. 32.

Papilio agestor agestor Jordan in Seitz, Macrolep., ix, 1909, p. 41, pl. 20, a.

The occurence of this species in the Malay Peninsula has been regarded hitherto with some doubt (see Jordan, *l.c.*), but Mr. G. C. Stubbs has taken recently three specimens on the hills dividing Selangor and Pahang; it would appear that the species is very local, and probably seasonal.

Selangor-Pahang border: near Fraser's Hill, 4200 feet, March 1933 (G. C. Stubbs).

Papilio payeni ciminius Fruh.

Papilio ciminius Fruhstorfer, Ent. Zeitschr. Stuttg., 1909, p. 177.

Papilio payeni ciminius Jordan in Seitz, Macrolep., ix, 1909, p. 92.

This species though not uncommon is usually difficult to capture as it flies, often at a considerable height and pace, over the higher hills of the Malay Peninsula. Sometimes the butterflies settle for a moment on tree tops, and a case is known where specimens have been picked up while drinking at a wayside stream. Usually they are not seen below 3000 feet.

The hitherto unknown and very rare ♀ has been taken on the Larut Hills above Taiping, Perak, once by Father R. Cardon (January 1931), and once by Mr. E. M. Hayward (1933). Unfortunately both examples are rather shattered, but the following description, based on the better specimen taken at 3750 feet in January 1933, is provided by Mr. Hayward:—

" ♀. Wings more ample and less falcate than in ♂. Upperside pale orange fulvous, all markings on forewing reddish to smoky brown, not black; hindwing with the postcellular band black. Forewing with a short crenulate line crossing the cell beyond the middle and a wider streak on the discoidals; apex and outer margin infuscated. A faint crenulate postdiscal and a heavier submarginal line separated from each other and the margin by the orange fulvous ground colour. Hindwing (imperfect) with a postcellular band broken into dark irregular spots.

Underside uniform pale orange fulvous, base and apex slightly darkened all markings smoky reddish-brown. Hindwing with a series of discal silvery brown-bordered lunules decreasing in prominence from the costa posteriorly. Expanse: 110 mm."

Family PIERIDAE.

* **Delias belladonna malayana** ssp. n.

Differs from *D. b. chrysorrhoea* Voll. (1865) from Sumatra, (see Seitz, ix, pl. 56 d.) in the following respects:

♂. Upperside: forewing with white spots smaller; the orange yellow tornal patch on the hindwing better defined, extending further distad, the black marginal area at anal angle being as narrow as in *hedybia* Jord. (1925) from Tenasserim; the white discal spots of the hindwing more diffuse distally and none of them sinuate.

Underside: spots smaller than in *chrysorrhoea* particularly the median submarginal spot of hindwing; cell of hindwing immaculate; orange anal area touching submarginal spot; median discal spot not tinted with yellow; forewing shorter than in *hedybia*.

♀. Differs from the ♂ in having the white discal series of spots on the hindwing wider and larger, that in space 2 touching veins 2 and 3 and slightly tinted yellow. Spot near base of space 6 large and prominent (obsolete in ♂). Expanse ♂, 57–66 mm.; ♀, 64 mm.

A long series of ♂ ♂ and 1 ♀ from Pahang: Cameron Highlands 4,800–5,200 feet, June 13–19, 1923; Gunong Berumban summit, 6,050 feet, June 17, 1923; March 14, 1924 (H.M.P.).

Pieris canidia malayica Mart.

Pieris melete malayica Martin, Ent. Zeits., xxiii, 1909, p. 161.

Pieris canidia Moulton, Journ. Malayan Br., Royal Asiat. Soc., i, 1923, p. 233.

The species referred to by Dr. L. Martin is undoubtedly *canidia* Sparrm. This determination has been confirmed by Dr. A. S. Corbet by comparison with specimens in the Natural History Museum, South Kensington. Moulton presumably overlooked Dr. Martin's paper or may have been misled by the specific name. This species is common in Hong Kong and undoubtedly has been introduced into Singapore, where it is now established, through the agency of shipping.

* **Cepora nerissa** (F.)

Papilio nerissa Fabricius, Syst. Ent., 1775, p. 471.

Huphina nerissa Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 141, pl. 64.

A single male specimen has been taken by Mr. E. M. Hayward (November 1932) on the limestone hills near Kuala Kangsar.

Upperside, the tip of the forewing is rather more heavily blackened than in specimens from Peninsular Siam and the veins on the underside are less heavily bordered with greenish scales, especially on the forewing. The yellow basal spot on the hindwing also is paler and smaller. It seems best to regard this as typical *nerissa* F., until more specimens are available for study. Length of forewing 27 mm.

* **Cepora boisduvaliana** (Feld.)

Huphina boisduvaliana Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 144, pl. 65.

This species which is regarded as essentially Philippine appears to be established on the lower slopes of Gunong Kledang in Perak where Mr. E. M. Hayward has taken several specimens.

Through the courtesy of Dr. R. C. McGregor, I have received for comparison a Philippine (Luzon) specimen from the Bureau of Science, Manila. The Perak butterfly differs from it chiefly in size (expanse 50.5 mm. as against 60 mm. for the Philippine example), and the slightly narrower black border on the upperside of the hindwing. A series would show whether these distinctions are constant and I defer imposing a subspecific name at present.

Perak: Gunong Kledang, June 1931 (E. M. Hayward). 1 ♂, expanse 50.5 mm. Presented to the Selangor Museum, Kuala Lumpur.

† **Cepora lea aora** ssp. n.

♂. Distinguished from *C.l. natuna* (Fruh.), by the lighter and reduced orange yellow patch at the tornal area of the hindwing upperside.

Underside: forewings lighter; hindwings with the yellow colour reduced especially at the base and along the costal margin, and also at the margin of space 6.

♀. Upperside, wings more heavily suffused with blackish-brown scales; forewings with whitish postcellular patches in spaces 5 and 4, a small ill-defined patch in 3 (often obsolete), and a long oval streak in 2; submarginal yellowish markings in 1–6, that in 3 being the most clearly defined. Hindwings with an oblong yellowish streak in 5, vein 5 being partly distinguished from the monotonous black brown ground colour with yellow scales. Dorsal margin grey.

Expanse ♂♂ 59–64 mm.; ♀♀ 56–59 mm.

East Coast: Pulau Aor, June 13th, 1912 (3 ♂♂) V. Knight; April 28th—May 8th, 1927 (7 ♂♂, 4 ♀♀, including types) N. Smedley.

Examples from Tioman Island agree well with *C. lea natuna* (Fruh.).

*** Appias nephele** (Hew.)

Pieris nephele Hewitson, Exot. Butt., ii, 1861, p. 11, pl. VI, No. 33.

Appias nephele Fruhstorfer in Seitz, Macrolep. ix, 1910, p. 152.

This is another Philippine species discovered recently in Perak. The specimen which is in fresh condition agrees well with Hewitson's description and figure (*l.c.*). It will be interesting to see whether the species can be regarded as a true resident in Malaya.

Perak: Chenderoh, May 1931 (E. M. Hayward). 1 ♂, expanse 63 mm.

*** Appias paulina neombo** Bsd.

Dr. A. S. Corbet writes (in litt. February 8th, 1933): "*A. paulina* Cr., comprises all the forms placed under *albina* Bsd., in Seitz, vol. ix, and in addition: *darada* Fruh., *paulina* Cr., *lankapura* Mre., *fasciata* Fruh., *galene* Feld., and *minato* Fruh."

The form that occurs in Malaya is *neombo* Bsd. Although widely distributed, the species is most plentiful in the north of the Peninsula.

Kedah: Kedah Peak 2,500–3,000 feet, June 27th, 1921. West Coast: Langkawi Ids. April 28th, 1928. Perak: Kuala Kangsar; Maxwell's Hill, 3,000 feet, June–July 1916 (H. C. Robinson and C. B. Kloss). Batang Padang, Pahang Road, May 26th, 1923 (H.M.P.). Pahang: Jerantut-Kuantan Road, May 30th, 1926; Cameron Highlands, 4,800 feet, May 31st, 1931. Selangor: Batu Caves near Kuala Lumpur, December 6th, 1923 (H.M.P.).

Appias leis distanti Mre.

Dr. A. S. Corbet writes (in litt. February 8th, 1933): "*A. leis* Hbn., comprises all the forms given under *melania* in Seitz, vol. ix, (except *melania* F., which is an Australian species), and with the addition of *wardi* Mre., and *yaksha* Fruh."

Although widely distributed on the plains and on hills, the species in Malaya is never abundant. The females shew remarkable variation especially on the underside of the hindwings. *Appias leis grisea* Moult., will be the race from Tioman Id. (See: Journn. Malayan Br., Royal Asiat. Soc., i, 1923, p. 234).

Ixias pyrene birdi Dist.

Ixias birdi Distant, Ann. Mag. Nat. Hist., (5), xii, 1883, p. 351.

The ♀ of this species is still apparently undescribed; the following notes are based on a specimen in the Selangor Museum, Kuala Lumpur.

♀. Upperside lemon-yellow; wing pattern as in *cingalensis* ♀ (see Seitz, ix, pl. 71d). The irregular enclosed subapical band on the forewing lemon-yellow without any trace of orange. Hindwings with a slightly narrower black-brown marginal band than in the ♂.

Underside lemon-yellow speckled with black brown scales, heavily marked at apex and outer margin. A prominent spot at the apex of cell; traces of a broken, outwardly-curved, postmedian band from costa to inner margin, a large, brown mark at tornal angle. Hind wings less heavily marked, the postmedian band less distinct, a black cell spot at base of vein 5. Expanse 57 mm.

Selangor: Ulu Langat, November 12th, 1915 (C. B. Holman-Hunt).

* **Ixias ludekingi alticola** ssp. n.

This Malayan hill race differs from *ludekingi* Voll., from the highlands of Sumatra, chiefly by its smaller size and the narrower black margin on the upperside of the hindwings. Ground colour of the upperside white, underside yellow.

♂. Forewings, the inner black border of the orange subapical fascia is wider than in *ludekingi*, and occupies the costal half of the cell, than curves round and fills the base of space 2 between the origin of vein 3 and almost to the origin of vein 2, thence to the inner margin.

♀. Forewings, the cell almost entirely filled with black except for a small space above the origin of vein 2: inner black border to the white subapical fascia entire and passing from the cell through the base of vein 3 to the inner margin.

Expanse ♂♂, 50–55 mm.; ♀♀, 52–55 mm.

Pahang: Lubok Tamang 3,500 feet, June 24th, 1923. Cameron Highlands 4,500 feet, May 28th, 1931. Fraser's Hill 4,000 feet, February 1st, 1929, May 31st, 1932, July 6th, 1931 (H.M.P.) 14 ♂♂, 4 ♀♀. Same locality August 18th, 1927 (J. E. Kempe), 1 ♀.

In the genitalia of *alticola*, the tegumen (dorsal view) narrows gradually before the uncus, while the uncus (lateral view) is slender and tapers evenly.

Family DANAIDAE.

* **Danaida gautama gautama** Mre.

Danais gautama Moore, Ann. Mag. Nat. Hist., (4), xx, 1877, p. 43.

Danaida gautama gautama Fruhstorfer in Seitz, Macrolep., ix, 1909, p. 203.

Two males from the Langkawi Islands off the west coast of the Peninsula do not differ in any marked degree from Moore's original description. Expanse 89–91 mm.

Langkawi Islands: Pulau Dayang Bunting, April 25th, 1928 (H.M.P.).

* **Danaida limniace limniace** (Cr.)

Papilio limniace Cramer, Pap. Exot. i, 1775, p. 92.

Danaida limniace limniace Fruhstorfer in Seitz, Macrolep., ix, 1909, p. 204.

The existence of this species in the Malay Peninsula has been regarded hitherto with some doubt as the only record was based on an old unlabelled specimen in the Raffles Museum collection (Moulton, Journ. F.M.S. Mus., x, 1921, p. 172). The species, however, has been taken recently in Perak.

Perak: Chenderoh (headwaters of Perak River), May 1931; Gunong Kledang 700–1,000 feet, October 1932 (E. M. Hayward). 2 ♂ ♂, expanse 87–88 mm.

Family SATYRIDAE.

Ypthima huebneri huebneri Kirby.

Ypthima hübneri Kirby, Syn. Cat. Diurn. Lep., 1871, p. 95, No. 18.

Judging by an examination of the genitalia it is this species and not *philomela* Joh., which extends throughout the Malay Peninsula at low elevations.

Ypthima pandocus tahanensis ssp. n.

This interesting local race frequents a comparatively small area on the upper slopes of Gunong Tahan (the highest hill in Malaya) from about 5,500 feet up to the summit, 7,186 feet.

Upperside, distinguishable from *corticaria* (which occurs at the foot of the mountain), by the more uniform coloration and the blurred yellow rings to the eyespots. The underside is distinctive in that the usual grey strigae are suppressed, especially on the basal half of the forewing, below the cell, and on the outer margin; or the strigae are widely separated. The hindwing also is predominantly brown in most examples, especially at the base and the outer margin, giving the wing a mottled appearance. The eyespots on the hindwing both of the ♂ ♂ and ♀ ♀ are much reduced in size. Expanse 43–48 mm.

Pahang: Gunong Tahan, 5,500–7,186 feet, December 1921–January 1923. A long series (H.M.P.).

Examination of the genitalia shews that they are a *pandocus* form, but their general appearance is so distinct that a race name seems warranted; most of the specimens when viewed in certain lights have an obvious lilac sheen which is not so noticeable in the lowland examples. I have taken typical *pandocus* at a similar elevation in West Java (Papandajan, 5,500 feet, April 1923), but in these the ground colour of the hindwings beneath is more intensely white.

Specimens from other hills in Malaya are not differentiable from lowland examples, even at 4,500 feet. This may be due to the fact that they follow up the grassy roadsides. In the case of Gunong Tahan there is no such direct access, and the species there must have been isolated for a long time.

***Ypthima savara** Gr. Sm.

Ypthima savara Grose-Smith, Ann. Mag. Nat. Hist., (5), xx, 1887, p. 267; Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 292.

Except for the rather smaller size, Malayan specimens agree well with the typical form which flies in the hills of Upper and Lower Burma, and Tenasserim. Identification was confirmed by examination of the genitalia (see Elwes and Edwards, Trans. Ent. Soc. London, 1893, p. 37, pl. ii, fig. 30).

This species must have been overlooked in the past, or mistaken for *pandocus*, as it is widely spread in the Malay Peninsula. Expanse 47–52 mm.

Kelantan: (T. S. Adams). Perak: Batang Padang, Jor Camp 1,800 feet, August 21st, 1922 (E. Seimund), May 29th, 1923 (H.M.P.). Selangor: Bukit Kutu, 3,000 feet, August 1915 (H. C. Robinson and C. Boden Kloss); Klang Gates and Gombak Valley (A. S. Corbet).

*** Elymnias dara darina** Fruh.

Elymnias darina Fruhstorfer, Iris, 1907, p. 215.

Elymnias dara darina Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 373.

The Sumatran race of this species is found in Malaya where it is distinctly rare. Expanse ♂, 59 mm.

Selangor: Dusun Tua, December 8th, 1905 (H. C. Robinson). Bukit Kutu, foot of hill March 9th, 1931, and Bentong Road, Pahang, March 14th, 1931 (A. S. Corbet).

*** Erites elegans distincta** Mart.

Erites distincta Martin, Iris, 1909, p. 153.

Erites elegans distincta Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 304.

In the absence of comparative material I have referred Malayan specimens to the Sumatran race, to which they bear a close resemblance. The median band on the hindwing beneath is convex and very nearly touches the postmedian irregular band near the base of vein 5. The postmedian band is blurred distally and coalesces with the brownish-yellow surrounds to the eyespots in spaces 3, 4, and 5. Expanse 51–58 mm.

Pahang: Senyum, Kota Tongkat; Rompin and Endau, June–July 1917 (H. C. Robinson and C. Boden Kloss); Kuala Tahan, 300 feet, November 1920–February 1921 (E. Seimund), Kuala Teku 500 feet, November 1921 (H.M.P., F. N. Chasen).

This species seems to be confined to little frequented districts on the eastern side of the main range; it is found only in primary forest. In places where it does occur it is commoner perhaps than *E. argentina delia* Mart., and *E. angularis angularis* Mre., all of which have been caught in the same localities.

Lethe verma robinsoni ssp. n.

Lethe verma Kollar. Pendlebury, Journ. F.M.S. Mus., x, 1922, p. 258.

I have drawn attention already to the occurrence of this species in Malaya, but hitherto have had no means of deciding whether this race differed sufficiently from those in Sikkim (*sintica* Fruh.) or Tenasserim (*stenopa* Fruh.) to deserve recognition. Dr. K. Jordan, to whom I sent a specimen, pronounces it a good subspecies.

♂. Band of the forewing above broader than in either *L. v. sintica* or *stenopa* with the spot in front of M2 (space 5) particularly broader than in those subspecies. On the underside hindwing the lines of the median area are more sharply dentate, the outer of the two with a distinct tooth in M2. Expanse 59–68 mm.

Pahang: Lubok Tamang 3,500–4,000 feet, September 8th, 1922 (nat. coll.); same locality, June 11th, 1923, and Cameron Highlands 4,800 feet, May 22nd, 1931 (H.M.P.).

From previous unpublished records it appears that the discoverer of this species in Malaya was the late Mr. H. C. Robinson, a specimen (No. 788) having been taken by him in the type locality on January 18th, 1902. This butterfly has a very restricted habitat and seems to be confined to an area of a few square miles.

* Lethe rohria (F.)

Papilio rohria Fabricius, Mant. Insect., ii, 1787, p. 45.

Lethe rohria Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 315.

This species has not yet been recorded from the Malay Peninsula where it is rather local, and perhaps commoner on the eastern side of the main range than the west.

The local specimens agree fairly closely with the description and figures of the typical form but comparative material (except of *L. r. godana* Fruh., from Java), is lacking, hence it is best to omit a race name for the present.

Compared with the Javanese race: the white discal forewing band is rather narrower and distinctly emarginate proximally at vein 2. The median line on the underside of the forewing, and the median and postmedian on the hindwing, as well as the surrounds to the yellow rings of the eyespots, are lilac-tinged; the irregular postmedian line of the hindwing is defined distally with brown scales of a darker colour than the normal ground colour. Expanse: 51–59 mm.

Pahang: Kuala Tahan, Kuala Tembeling, November 1920–February 1921, (E. Seimund). Selangor: Kuala Lumpur, October 7th, 1921, (H.M.P.).

* Lethe vindhya (Feld.)

Debis vindhya Felder, Wien. Ent. Monats., iii, 1859, p. 402.

Lethe vindhya Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 319, fig. 98*b*.

The tail of the hindwing appears to be shorter and broader than in the figured specimens. Presumably a very local species.

Pahang: Fraser's Hill, 4,200 feet, May 29th, 1932 (H.M.P.). ♂, Exp. 70 mm.

Several further specimens were seen when the above capture was made, but were very shy and unapproachable. They were flying in heavy jungle on a dull morning.

* Lethe sinorix (Hew.)

Debis sinorix Hewitson, Exot. Butt., iii, p. 78, pl. xxxix, figs. 19, 20.

Lethe sinorix Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 319, pl. 98, *b*.

Pahang: Fraser's Hill, 4,200 feet, June 1932, July 1933 (G. C. Stubbs).

* Mycalesis anaxioides Marsh.

Mycalesis anaxioides Marshall, in Marshall and de Niceville, Butt. Ind., i, 1883, p. 107; Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 354.

Nothing definite seems to have been recorded about this species in the Malay Peninsula, where it occurs sparingly.

Comparing Malayan specimens with Marshall's original description (*l.c.*), they differ in having the decided lilac and yellowish tints which seem to be lacking in the typical series from Upper Tenasserim. An eyespot is indicated in space 2 on the upperside of the forewing, ♂, and the eyespots on the underside of the wings, especially the hindwings, are larger, and clearly defined with yellow rings. Expanse, ♂, 60 mm; ♀, 63 mm.

Perak: Jor Camp, Batang Padang, 2,000 feet, August 29th, 1932, (E. Seimund). Selangor–Pahang Border: The Gap, 2,700 feet, April 7th, 1910. Selangor: Ginting Bidai, 2,000 feet, (C. Boden Kloss). Bukit Kutu (without further data).

* **Mycalesis visala** Mre.

Mycalesis visala Moore, Cat. Lep. Mus. E.I.C., 1857, p. 230. Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 346.

This species extends its range to the Malay Peninsula where it is represented by the wet-season form. Upperside forewing with a large eyespot in space 2, and indications of a subapical spot. Underside with the apical eyespot carrying a small accessory spot; the large lower eyespot with or without an accessory spot. Expanse ♂, 45–48 mm.

Kelantan: (T. S. Adams). Perak: Taiping. Pahang: Kuala Teku. Negri Sembilan: Bukit Tangga, 1,200 feet, September 1915. Also, Peninsular Siam: Nakon Sri Tamarat, Tai Sai river, 300 feet, February 20th 1922 (H.M.P.).

* **Ragadia crisilda critolina** Evans.

Ragadia crisilda critolina Evans, Journ. Bombay Nat. Hist. Soc., xxix, 1923, p. 789, pl. xiii, D. 18. 1.

Except for the rather larger size, the Malayan race agrees well with this subspecies from the Dawnas and South Burma. In Malaya the species is confined to high elevations and is local. Expanse: ♂, 42–45.5 mm. ♀, 46 mm.

Pahang: Cameron Highlands, 4,800–5,200 feet, June 14th, 1923, March 18th, 1924, May 20–24th, 1931. Fraser's Hill, 4,000 feet, May 29th, 1932 (all H.M.P.). Hill path between the Gap and Fraser's Hill, 3,500–4,000 feet, January 1915 (C. B. Holman-Hunt).

Ragadia crisia siponta Fruh. var.

Differs from *crisia siponta* Fruh., by its smaller size, and especially on the underside by the absence on both wings of the black, yellow-ringed eyespots which are indicated by silvery points on a whitish background. The postdiscal brownish line is broader, especially on the hindwing, and blurred distally, some brownish scales scattered on the cream coloured submarginal area. Expanse: 38.5 mm. 1 ♂.

Perak: Padang Renggas, The Hermitage, 3,000 feet, March 1909, (R. Cardon). An interesting 'sport' of this common jungle species.

Family AMATHUSIIDAE.

*** Faunis taraki** sp. n.

This apparently distinct species comes between *F. arcesilaus* (Fabr.), and *kirata* (de Nic.).

♂. Upperside rich fulvous without much appreciable darkening towards the outer margins, except very narrowly at the apex of the forewing and the anal angle of the hindwing.

Underside, uniform blackish-brown (with a slight purplish tinge in some lights), of a hue similar to *arcesilaus canens* (Hbn.) from Java. Forewing with two obsolescent lines in the cell; a fine, even median line from midcosta, angled inwards at vein 4, slightly convex at vein 3, and disappearing in the basal half of vein 2. Small yellow points in spaces 2–7, that in space 6 being largest; a fine straight submarginal line at a distance of about 3 mm. from the margin. Hindwing with subbasal and median bands as in *arcesilaus*, but in *taraki* the median band is more outwardly curved at the end of the cell; a series of yellow points in spaces 1–6, and an indistinct terminal line about 4 mm. from margin.

The main distinguishing features between this species and its allies are the richer and more uniform coloration of the upper and undersides. On the underside of the forewing the fine even median line arises at midcosta and not beyond it, and is clearly defined rather than zigzag and broad, or blurred; on the hindwing the median band is curved outwardly round the end of the cell. Expanse 67 mm.

Pahang: Lubok Tamang, 3,500 feet, June 8th, 1923 (H.M.P.). Type ♂. Selangor: Kuala Sleh (Klang Gates), August 5th, 1929, July 26th, 1932 (A. S. Corbet).

*** Amathusia (Pseudamathusia) masina** Fruh.

Amathusia masina Fruhstorfer, Iris, 17, 1904, p. 155.

Amathusia (Pseudamathusia) masina Fruhstorfer in Seitz, Macrolep., ix, 1911, p. 431.

The species in this subgenus are at once distinguished in having an androconial cavity between the costa and subcosta on the upperside of the hindwing, and there is corresponding friction patch on the underside of the forewing. The occurrence of this species in the Malay Peninsula and in Peninsular Siam increases its range considerably as it was known hitherto only from South East Borneo and Banka Id. No race name is proposed, however, as it has not been possible to refer to the original description, nor are specimens from the type locality available for comparison.

Upperside, a uniform light reddish-brown rather darkening towards the tornus of the hindwing, the white markings from the underside scarcely showing through. Underside of a lighter colour with a faint mauve tint in some lights; the white bands about as wide as in other species of the genus, but the postmedian line is very fine except at the costa where it broadens into a transverse white spot. The species in Malaya seems to be confined to primary forest. Expanse ♂, 98–105 mm.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 1,200 feet, February 1922 (H.M.P.). Malaya: West Coast, Langkawi Ids., December 1916–January 1917 (H. C. Robinson and C. Boden Kloss). Pahang: Sungai Tahan, 300 feet, November 30th, 1921, (F. N. Chasen).

* **Enispe euthymius corbeti** ssp. n.

The Malayan race is closely related to *duranius* Fruh., (1911) from Sumatra, and forms an interesting link between this and the Sikkim-Siam form, *tessellata* Mre. (1883). It appears to differ from either in the much heavier markings on the upperside of both wings.

♂. Upperside xanthine orange, duller at the basal third, and below the cell to the basal half of the forewings. All markings black.

Forewings with two rather wavy, oblique, indistinct lines in cell; a subrectangular, outwardly concave spot at apex of cell, often with a short inwardly-directed tooth. A rather broad median line from vein 8, angled in space 4 and extending to space 1. A postmedian line joined to the median line by the patches on veins 2, 3, and 4, and faintly to the black subapical patch through space 6. A broad submarginal wavy line extending into the basal half of space 1*a* but not reaching the inner margin and enclosing six variable patches of xanthine orange between it and the broad marginal line on which there are five rather indistinct orange spots in spaces 1–5.

Hindwing with tuft of long brownish hairs covering the cell, and extending along the dorsal margin. A fine, rather indistinct, straight discal line from costa to tornus, between this and the inner submarginal line is an indistinct band extending from veins 3–6, inner submarginal line complete, wavy, and deeply intended as in *tessellata* Mre.; the outer submarginal line more indented than in either *tessellata* or *duranius*, margin narrowly brown. Speculum at base of hindwings whitish with cream coloured hairs.

Underside golden brown with faint lilac reflections, and with most of the markings on the upperside showing through. Forewings with a broken band near base of cell, a broader, outwardly diffuse curved band in the middle and a dark spot at apex of cell. A median line distally defined with golden yellow extending from costa to the middle of space 1.

Hindwings with a faint subbasal cell spot, a broken subbasal line and a fairly straight median line as on forewing. A small black ocellus in spaces 6, 5, and 2, the first and last having a small white centre. Basal half of both wings rather darker than apical half. Nervures golden brown. Head, thorax and abdomen rich brown above, light golden beneath, abdomen with a large black distally emarginate patch on the third ventral segment. Antennae reddish brown above, golden yellow beneath, tibiae and tarsi browner. Expanse: ♂, 84–92 mm.

Selangor: Gombak Valley, January 27th, 1931; Bukit Kutu, 3,300 feet, at bait March 20th and 21st (type) 1931 (A. S. Corbet). Same locality, September 23rd–October 3rd, 1932 (H.M.P.). Mr. G. C. Stubbs tells me he has taken this species also on Fraser's Hill (4,000 feet) in Pahang. The specimens examined shew little variation except that some are rather more heavily marked with black than others.

I am glad to associate this race with its discoverer, Dr. A. S. Corbet, who keenly interested himself in the study of Malayan butterflies during his stay in this country.

Family NYMPHALIDAE.

* **Ergolis taeniata** Feld.

Wein. Ent. Mon., v, 1861, p. 303. Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 457, pl. 107c.

A single male specimen of this Philippine species has been discovered entangled in a spider's web in Perak. Almost certainly an introduced species. Expanse 47 mm.

Perak: Chenderoh, May 1931 (E. M. Hayward).

* **Cirrochroa surya siamensis** Fruh.

Cirrochroa surya Moore, Proc. Zool. Soc., 1878, p. 827.

Cirrochroa surya siamensis Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 480.

This race occurs within our limits on the Langkawi Islands off the west coast of the Peninsula. It is quite common. Expanse 50–58 mm.

Langkawi Islands, April 17th–30th, 1928 (H.M.P.).

† **Cynthia erota tiomana** ssp. n.

This race occurs on Tioman Island, which lies about thirty miles off the east coast of the Peninsula opposite the State of Johore.

The specimens show a much closer affinity to *natunensis* Fruh., from the Anamba and Natuna Ids. than to the peninsular *erotella* Btlr.

♂. Forewings more acute and a richer colour than in *natunensis*, the black markings less prominent. Underside of a richer reddish colour, forewing with the outer discocellular line (the fourth) bent inwards anteriorly and joined to the third; the blackish median line always sharply incurved in space 4. Hindwings with the median line always crossing the cell nearer the apex than in *natunensis*. Expanse 68–82 mm. A long series ♂ ♂.

Tioman Island: June–July 1916 (H. C. Robinson and C. Boden Kloss); April 25th, 1927 (N. Smedley and M. R. Henderson).

Cynthia erota ab. cantori Dist.

Cynthia cantori Distant, Ann. Mag. Nat. Hist., (5), x, 1882, p. 406. Rhop. Mal., 1883, p. 185, pl. x, fig. 5.

Cynthia erota cantori Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 477.

From an examination of the type and only known specimen which is in the Tring Museum, I conclude that this is merely a 'sport' of the common *C. erota erotella* Btlr. Messrs. L. de Nicéville and L. Martin have already suggested this as a possibility (Journ. Asiat. Soc. Bengal, lxiv, 1895, p. 403). Although Fruhstorfer denominated this as ♂-*ab. cantori* in Iris, xii, 1899, p. 84, he considered later (Macrolepid. *l.c.*) that *cantori* may be an 'Alpine race' of the species, but there is no supporting evidence as the specimen in question was found in Province Wellesley where there is no hill of more that a few hundred feet in height. Were *cantori* a montane butterfly it would almost certainly occur on Kedah Peak which is just under 4,000 feet and about twenty five miles north of Province Wellesley, but there, as on other hills in the Peninsula, *C. e. erotella* is the only representative. The rare females are rather variable.

Precis almana javana Feld. var.

This specimen differs from *almana javana* Feld., as follows: upperside forewing, by the absence of the second postdiscal bar from costa to the lower discocellular; the subapical streak is merged into the blurred submarginal and marginal bands which here are not differentiated. The eyespot in space 2 is much reduced in size, especially distally. Hindwing heavily infuscated, all markings blurred. The black-ringed discal ocelli indistinct and marked proximally with a blackish smudge; a small yellow-brown spot in space 2 represents the usual black-ringed ocellus.

Underside, cinnamon buff without any definite lines; the markings of the upperside showing through indistinctly, and the eyespots appearing in a rather lighter shade. Expanse 50 mm. 1 ♂, Paris Museum.

Upper Perak: Grik, May 1924, (R. Cardon).

* **Yoma sabina vasuki** Doh.

Papilio sabina Cramer, Pap. Exot., iv, (25), 1780, p. 1.

Yoma vasuki Doherty, Journ. Asiat. Asiat. Soc. Bengal, lv, 1886, p. 259.

Yoma sabina vasuki Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 540, pl. 113*b*.

A single male specimen from the Langkawi Islands. Expanse 68 mm.

Langkawi Islands: December 1916–January 1917 (H. C. Robinson and C. Boden Kloss).

* **Stibochiona nicea subucula** Fruh.

Adolias nicea Gray, Lep. Ins. Nepal, 1833–46, p. 13, pl. 12, fig. 1.

Stibochiona nicea subucula Fruhstorfer, Berl. Ent. Zeitschr., xlii, 1898, p. 329. Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 569, pl. 115*e*.

Malayan examples seem to agree with the blue form of this race described from Tenasserim and the Karen Hills. Though widely distributed in Malaya it is a rare or very local insect. Expanse 66–70 mm.

Negri Sembilan: Bukit Tangga. Selangor: Bukit Kutu, 3,300 feet, September 1932 (H.M.P.). Pahang: Bentong Road, quarry, June 16th, 1929, December 15th, 1929 (A. S. Corbet).

† **Cyrestis periander robinsoni** ssp. n.

This island race is distinguishable at a glance from mainland specimens (*periander* F.) by the bases of the wings being heavily grey-dusted as far as the third meridional line. These orange lines are dull owing to the overlying grey scaling, and are rather wider than in the typical form causing the reduced postmedian white fascia to a stand out in strong contrast to the rest of wing. Expanse ♂ ♂, 35–42 mm. ♀ ♀, 43–48 mm. A series.

East Coast: Tioman Island, June–July 1916 (H. C. Robinson and C. Boden Kloss).

Godfrey (Journ. Siam Soc., Nat. Hist. Suppl., vol. vii, 1930, p. 276), states that "*C. p. siamensis* Fruh., a very large and dark form described by its author from two specimens one of which is in the British Museum......may possibly have come from Pulau Aor, an island off the south-east of the Malay Peninsula." There are two specimens from Pulau Aor in the Selangor Museum, dated June 13th, 1912, that fit Fruhstorfer's description fairly well. They are larger (expanse 47 mm.) than Tioman Island specimens and have the basal two-thirds of the wings even more heavily infuscated.

Some species from Tioman Island and Pulau Aor are indistinguishable, while others, especially those that are not strong on the wing, are sufficiently differentiated to warrant subspecific denomination. The validity of this new race, however, awaits comparison with a type of *siamensis* Fruh.

† **Cyrestis periander klossi** ssp. n.

Another island race, on the average larger and darker than specimens from Tioman Island and Pulau Aor. Quite distinctive by the broad, inwardly blurred forewing margin which is scarcely narrowed below vein 5, occupies rather more than a third of the wing and almost touches the third meridional line on vein 2 and 3; postmedian fascia very narrow. Hind wing with a broader orange fascia before the submarginal heart-shaped spots. Underside with all the markings broader especially the third meridional line and the distal orange fascia on the hindwing. Expanse, ♂ ♂, 43–47 mm. ♀ ♀, 50–55 mm.

North East Coast: Pulau Perhentian Besar, June 11th, 1926; Pasir Patani, June 13–14th, 1926. 4 ♂ ♂, 2 ♀ ♀. (C. Boden Kloss).

* **Chersonesia risa cyanee** Nic.

Cyrestis risa Doubleday, Gen. Diur. Lep., ii, 1850, p. 262.

Cyrestis (*Chersonesia*) *cyanee* de Nicéville, Journ. Bombay Nat. Hist. Soc., vii, 1892, p. 556; id., viii, 1893, p. 49, pl. L., figs. 6, 7.

Chersonesia risa cyanee Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 592.

The hitherto unrecorded Malayan race of this species is referred to that of Sumatra and Borneo, although several specimens recall the typical *risa*. It seems to be confined to the northern half of the Peninsula and is commonest perhaps on the Larut Hills above Taiping at elevations between 3,000–4,500 feet. Expanse ♂ ♂, 30–42 mm.; ♀ ♀, 42–45 mm.

Peninsular Siam: Nakon Sri Tamarat, Khao Rompibun, March 8th, 1922 (H.M.P.); Trang, Banchong, May 15th, 1924 (I. H. N. Evans). Perak: Larut Hills, 3,000–4,500 feet, February 6th–12th, 1932; Batang Padang, Jor Camp, 1,800 feet, June 2nd, 1923 (H.M.P.). Pahang: Lubok Tamang, 3,500 feet, June 1923, March 1924 (H.M.P.). Tanah Rata 4,800 feet, January 31st, 1930 (A. S. Corbet).

† **Chersonesia rahria tiomana** ssp. n.

This island race is distinguishable from *rahria rahria* Mre., which flies on the mainland, by its rather larger size, brighter coloration, less strongly marked diffuse postdiscal line and more rounded wings. Length of forewing: ♂ ♂, 18–21 mm. (*rahria* ♂ ♂, 14.5–18.5 mm.). ♀ ♀, 21–22 mm. (*rahria* ♀ ♀, 20 mm.).

Tioman Island, June–July 1916 (H. C. Robinson and C. Boden Kloss). 6 ♂ ♂, 3 ♀ ♀.

† **Neptis columella parvimacula** ssp. n.

Separable from *N. c. martabana* Mre., by the white markings being much reduced in size. The subbasal band of the hindwing is narrow and broken into four parts: from inner margin to space 2, space 4, space 5, and a small oval spot in space 6. The thin pale discal line is blurred, and the subterminal line is scarcely discernible. Expanse 66 mm.

Tioman Island, June–July 1916 (H. C. Robinson and C. Boden Kloss) 1 ♂.

* **Neptis ebusa fuliginosa** Mre.

Neptis ebusa Felder, Wien. Ent. Monats., vii, 1861, p. 112.

Neptis fuliginosa fuliginosa Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 622.

Neptis ebusa fuliginosa Evans, Journ. Bombay Nat. Hist. Soc., xxx, 1924, p. 79.

Four specimens of this rare *Neptis* have been taken recently in Selangor, and its occurrence elsewhere in the Peninsula may be expected. Expanse 52 mm.

Selangor: Klang Gates, October 14th, 1928, October 5th, 1930; Gombak Valley, March 17th, 1929, Ampang Forest Reserve, December 28th, 1929 (A. S. Corbet). 4 ♂ ♂.

* **Pantoporia ranga malaya** ssp. n.

Kironga abiasa Moore, Lep. Ind., iii, 1896–9, p. 213, pl. 270, fig. 2, ♂.

This butterfly in Malaya is confined to the tops of hills over 3,000 feet in height.

♂. Upperside forewing: differs from *ranga* Mre. in having a prominent white basal cell streak succeeded by a large oblong white spot and a small white discoidal mark; a transverse postdiscal series of three obliquely placed subapical ovate spots, and a small fine costal streak; the evenly rounded spot in space 2 is divided by a vein from a smaller spot in 3. A prominent, broken, and somewhat irregular white submarginal line succeeded by an obscure brownish marginal line to space 6. Hindwing: the discal vein-divided band is narrow, the postdiscal series of white conoid spots is present and there is an obscure brownish marginal line; cilia tipped with white in all the spaces up to 4 on forewing.

Underside with all the white markings (which in certain lights have a bluish or lilac reflection) clearly defined, except the blurred marginal lines on the fore- and hindwings. The postdiscal whitish markings defined inwardly with blackish streaks. Abdomen black above, white beneath, with a basal white band across the dorsum, and three or four small lateral white tufts.

♀. Similar to the ♂ but the white markings smaller. Expanse, ♂ ♂, 54–67 mm.; ♀ ♀, 58 mm.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 5,800 feet, March 30th, 1922 (H.M.P.). (Recorded by me as *abiasa clerica:* Journ. F.M.S. Mus., xi, 1923, p. 39).

Selangor: Bukit Kutu, 3,500 feet, March 18th, 1931 (H.M.P.), August 1915 (H. C. Robinson). Pahang: Cameron Highlands, Rhododendron Hill, 5,200 feet, June 19th–21st, 1923; Gunong Terbakar, 4,500 feet, June 9th, 1923 (all H.M.P.).

Moore (*l.c.*) describes and figures the ♂ of this species as that of *abiasa clerica* Btlr., but we have both sexes of *ranga malaya* and *abiasa clerica* in the Selangor Museum. The sexes in the latter species are similar, the ♂ being rather smaller and having a more acute apex to the forewing. In *ranga malaya* the white-tipped ciliæ only reach space 4 on the forewing, whereas in *abiasa clerica* it is invariably present in space 7 of the forewing also, and in the last-named species the lateral white abdominal tufts are absent.

* **Pantoporia cama** (Mre.)

Athyma cama Moore, Cat. Lep. Mus. E.I.C., i, 1857, p. 174.

Pantoporia cama Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 632, pl. 123, c.

At present we know this species in Malaya from three female specimens only. Expanse, 59–68 mm.

Pahang: Bentong, June 1910. Perak: Maxwell's Hill, 3,500 feet, June 1929 (R. Cardon), February-March 1929 (A. S. Corbet).

Limenitis agneya Doh.

Limenitis agneya Doherty, Journ. Asiat. Soc. Bengal, 1891, p. 176.

Limenitis agneyana (sic.) Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 638.

The original spelling of this specific name should be retained. The species, originally described from the Larut Hills above Taiping (Perak), occurs also at 4,200 feet on Fraser's Hill (Pahang) and at 3,500 feet on Bukit Kutu (Selangor), in company with the commoner *L. daraxa theoda* Fruh.

* **Tanaecia calliphorus Feld.**

Wein. Ent. Monats., v, 1861, p. 302. Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 650.

The occurrence in Malaya of this species is most surprising, as it has been known hitherto only from the Philippines. Mr. Hayward, who collected the specimen, assures me that several were seen in the same locality, but having no net he was unable to secure more than one, which he caught with his topee. Expanse, ♂, 68 mm.

Perak: Tanjong Tualang, June 1930 (E. M. Hayward).

* **Euthalia cocytus satropaces** Hew.

Papilio cocytus Fabricius, Mant. Ins., ii, 1787, p. 29.

Euthalia satropaces Hewitson, Ent. Month. Mag., xiii, 1877, p. 150.

Euthalia cocytus satropaces Fruhstorfer in Seitz, Macrolep., ix, 1912, p. 658.

Specimens from the Langkawi Islands compare well with this race from Lower Burma, Tenasserim and the Mergui Archipelago. The coloration of the underside ♂ is pale ochreous. Expanse ♂, 58–59 mm.; ♀, 68 mm.

Langkawi Islands: December 1916–January 1917 (H. C. Robinson and C. Boden Kloss), April 26th–30th, 1928 (H.M.P.).

Euthalia eriphylae eriphylae Nic.

Euthalia eriphylae de Nicéville, Journ. Bombay Nat. Hist. Soc., vi, 1891, p. 353, pl. F, fig. 7.

Euthalia eriphyle eriphyle Fruhstorfer in Seitz, Macrolep., ix, 1913, p. 670. (*eriphyle* Auctt.).

Attention is drawn to the original spelling of this specific name.

* **Sephisa chandra** (Mre.)[2]

Castalia chandra Moore, Cat. Lep. E.I.C., 1858, p. 200.

Sephisa chandra Fruhstorfer in Seitz, Macrolep., ix, 1913, p. 701.

Dr. A. S. Corbet has seen a specimen which is in Mr. Stubbs' collection at present in London. Dr. Corbet states (in litt. dated 23.4.33) that the specimen is larger and has more orange colouring than *androdamas* Fruh., figured in Seitz (*l.c.*, pl. 114, c).

Mr. Stubbs informs me that he took the specimen in Pahang during June or July 1932, either on Cameron Highlands (5,000 feet) or Fraser's Hill (4,000–4,200 feet). He has seen the species on several occasions at both these places, but owing to swift flight it is difficult to capture.

* **Herona marathus** Dbd.

Herona marathus Westwood, in Doubleday and Westwood, Gen. Diurn. Lep., 1850, p. 294, pl. 41, fig. 3. Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 705, pl. 116, b.

A male example from the Langkawi Islands possibly represents a new race; it is much smaller than *angustata* Mre., and the postdiscal band in the forewing is interrupted between spaces 3 and 5; the orange yellow bands on the hindwing appear to be narrower than in that race. Expanse 61 mm.

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[2] I have since taken three ♂♂ of this species in Malaya; they apparently represent a distinct subspecies.

Pahang: Fraser's Hill 4,200 feet, July 2nd, 1933, 1♂; Pine Tree Hill 4,600 feet, July 3rd, 1933, 2 ♂♂ (H.M.P.).

Langkawi Islands: December 1916–January 1917 (H. C. Robinson and C. Boden Kloss).

* **Herona sumatrana** Mre.

Herona sumatrana Moore, Trans. Ent. Soc. Lond., 1881, p. 308. Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 706.

The first Malayan specimen was discovered in Perak in 1923, it has been found since in Selangor and Pahang. Expanse ♀, 74 mm.

Perak: Batang Padang valley, 18th mile Tapah-Pahang Road, October 10th, 1923 (H.M.P.). Selangor: Ulu Langat, June 30th, 1929, Pahang: Bentong Road, quarry, August 4th, 1929, March 30th, 1930 (A. S. Corbet).

* **Eriboea eudamippus peninsularis** ssp. n.

The Malayan race of this handsome species comes near to *nigrobasalis* Lathy (Siam and Shan States) but differs in being rather smaller, and having smaller submarginal and marginal yellow markings on the broad black apical and costal area of the forewing. On the hindwing the yellow postdiscal spots are larger, and more as in the typical *eudamippus* Dbd. The black postdiscal line is defined inwardly with greyish-blue scaling from the tornus to space 4 only. Forewing underside with the arm of the Y in space 3 longer and extending to within 2.5 mm. of the postdiscal line. Expanse, ♂ ♂, 85–86 mm.

Perak: Batang Padang, Jor Camp, 1,800 feet February–March 1915 (C. B. Holman-Hunt) 5 ♂ ♂. Pahang: Lubok Tamang, 3,500 feet, March 7th, 1924 (H.M.P.) 1 ♂ (type). This is the most southerly race of the species.

Family ERYCINIDAE.

Zemeros flegyas allica (F.)

Papilio flegyas Cramer, Pap. Exot., iii, 1780, pl. 280, figs. E, F.
Papilio allica Fabricius, Ent. Syst., iii, 1793, p. 244.
Zemeros flegyas allica Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 773.

Although *Z. f. albipunctata* Btlr., flies on the mainland in Malaya, the Langkawi Island race is distinct and presumably referable to *allica* from Siam.

West Coast: Langkawi Ids., April 18th–May 1st, 1928 (H. M. Pendlebury).

* **Dodona eugenes** Bates.

Dodona eugenes Bates, Journ. Linn. Soc., Zoology, ix, 1867, p. 371. Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 775.

I have deferred imposing a name to the Malayan race of this species owing to lack of literature, but it may be referable to *venox* Fruh.

♂. Upperside black; forewing markings reddish-yellow with the exception of three small subapical white spots. Underside with intense silvery white markings on the fore and hindwings.

♀. Upperside with dull reddish-yellow markings, those near the costa and apex of the forewing being whitish. Underside with silvery white markings not so strongly marked as in the ♂. Expanse, ♂, 42 mm.; ♀, 48 mm.

Pahang: Gunong Tahan, 5,500–7,000 feet, December 19th, 1921 (F. N. Chasen); same locality, Seat Point 5,460 feet, January 3rd, 1923 (H. M. Pendlebury). 1 ♂, 1 ♀.

* **Dodona egeon** (Dbd.)

Taxila egeon Doubleday, Gen. Diurn. Lep., 1851, p. 422.
Dodona egeon Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 776.

This species is not uncommon on certain hill tops in Malaya at an elevation of over 3,000 feet. Expanse 43–50 mm.

Selangor: Bukit Kutu 3,500 feet, September 13th, 1929, September 30th, 1932. Pahang: Cameron Highlands 4,800 feet, May 21st, 27th, 1931. Gunong Tahan, Skeat's Hill 4,800 feet, February 2nd, 1923 (all H. M. Pendlebury).

Dodona henrici Holl.

Dodona henrici Holland, Amer. Ent. Soc., xiv, 1887, p. 119, pl. ii, fig. 2. Fruhstorfer in Seitz, Macrolep., ix, 1914, p. 777.

This species has been recorded already from the Malay Peninsula by H. C. Robinson (Journ. F.M.S. Mus., i, 1906, p. 15, as *Dodona deodata*).

If we regard the collective species as *D. henrici* as suggested by Fruhstorfer (*l.c.*) then it will be necessary to await comparative material before denominating the Malayan race. However, specimens from Selangor agree well with *fruhstorferi* Röber, from Java, but have a rather larger amount of black on the upper surface of the wings. Kedah specimens have the basal third of the wings rather darker than in either Selangor or Javan examples, and there are three or four light yellow spots on the black apical third of the forewing, instead of only two.

As with all *Dodona* species in Malaya, they occur only at elevations over 3,000 feet and are rapid flyers. Expanse, ♂♂, 41–45 mm.; ♀♀, 49–52 mm.

Selangor: Bukit Kutu, 3,500 feet, August 1905 (H. C. Robinson), April 19th, 1926, March 13th–21st, 1931, September 29th, 1932 (H.M.P.). Kedah: Kedah Peak, 3,950 feet, March 15th–23rd, 1928 (H. M. Pendlebury). 9 ♂♂, 2 ♀♀.

Family LYCAENIDAE.

* **Lycaenopsis marginata** (Nic.)

Cyaniris marginata de Nicéville, Journ. Asiat. Soc. Bengal, lii, 1883, p. 70, pl. 1, fig. 9.

The Malayan race may be the form that Butler described as *Cyaniris splendens* (Ann. Mag. Nat. Hist., (7), v, 1900, p. 444), and which Fruhstorfer (Seitz, Macrolep., ix, p. 869) associates with *puspa*.

Pahang: Cameron Highlands 4,800–4,900 feet, January 12th, 1924 (M. R. Henderson). May 22nd–25th, 1931 (H. M. Pendlebury). Perak: Larut Hills 3,700–4,500 feet, February 9th–14th, 1932 (H. M. Pendlebury).

* **Lampides pura pura** Mre.

Lampides pura Moore, Journ. Linn. Soc. (Zool.), 1886, p. 41.

Lampides celeno pura Seitz, Macrolep., ix, 1924, p. 904.

Jamides cleodus pura Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 237.

Captain N. D. Riley has pointed out (in litt. dated October 7th, 1931) that an examination of the genitalia shows *cleodus* and *pura* to be very distinct species, the former not occurring in Malaysia, but only in the Philippines and possibly Celebes. Pending the publication of Captain Riley's revision of the genus, it is better to regard this rather widely distributed forest butterfly as *pura pura* Mre. Similarly, it appears that *L. malaccana* Röber should not be associated with *suidas* Feld., from the Philippines (Seitz, *l.c.* p. 906) but with *saturata* Snell., from Java. The Malayan race therefore should be *L. saturata malaccana* Röb.

* **Tajuria larutensis** sp. n.

Closely allied to, and probably a race of *T. albiplaga* Nic. (P.Z.S., 1887, p. 459).

♂. Upperside. Wings caerulean blue with a faint lilac tinge according to the incidence of light. Forewing with the basal sixth of the costal margin grey, remainder of the costal border as far down as the upper discocellular broadly black increasing in width towards the apex, and then decreasing at the termen to a fine black line from vein 2 to tornus. An ill-defined whitish area (not clearly marked as in *albiplaga*) at the base of vein 3, 4, and the discoidal.

Hindwing with the costal border grey as far as vein 7; a fine black anteciliary line not reaching costa; anal lobe with a small black orange-crowned mark, and two indistinct marginal black spots in spaces 2 and 3. Veins 1 and 2 each bearing a black, white-tipped tail 4 mm. in length. Cilia grey, but darker at vein endings 3–7.

Underside. Pale grey; both wings with a narrow streak closing the cell; a postmedian line of uniform width;

a faint submarginal macular band; margin slightly darker than the rest of the wing, and a dark anteciliary line on both wings as far as vein 7.

Forewing with the postmedian line rather wavy, interrupted by the veins, and extending from vein 7 almost to vein 1.

Hindwing with the postmedian line reaching vein 8, more irregular than on the forewing and pushed slightly outwards in spaces 5 and 4; then broken, zigzag, and recurved towards the inner margin. A black spot in space 2 proximally bordered with a large orange patch; the black anal lobe surmounted by an orange streak which runs parallel to the postdiscal line, the space between them being whitish.

Antennae black above and with some white scaling beneath, tip reddish. Palpi rather long; black above, white beneath. Legs light grey with the tibiae and tarsi annulated with blackish. Thorax above bluish-grey, abdomen black. Beneath, thorax and abdomen greyish-white. Expanse, 35 mm.

Perak: Larut Hills 3,700–4,000 feet, February 12–14th, 1932 (H. M. Pendlebury). 2 ♂♂.

* **Catapaecilma subochrea evansi** ssp. n.

♂. Differs from the typical *subochrea* Elwes (P.Z.S. Lond., 1892, p. 640, pl. xliv, fig. 10), from the Karen Hills in the following respects: upperside bluer, and the usually broad black border reduced to a narrow line. Underside with the markings very much narrower leaving far more of the ochreous ground colour visible. Expanse, ♂, 28 mm.

Selangor: Klang Gates, June 8th, 1924 (H. M. Pendlebury). A forewing of this race also was picked up by Dr. A. S. Corbet near Jor, Perak, (February 1930). I have pleasure in associating this race with Brigadier W. H. Evans, C.S.I., C.I.E., D.S.O.

* **Biduanda nicévillei** Doh.

Biduanda nicévillei Doherty, Journ. Asiat. Soc. Bengal, lviii, 1889, p. 426, pl. 23, fig. 16; Seitz, Macrolep., ix, 1926, p. 988.

Previously known from Myitta in Tenasserim; a pair from Selangor agree well with the original description and figure. Expanse, 33–35 mm.

Selangor: Bukit Kutu 3,300–3,500 feet, September 24th and 29th, 1932 (H. M. Pendlebury).

* **Rapala rhoecus** Nic.

Rapala rhoecus de Nicéville, Journ. Bombay Nat. Hist. Soc., x, 1895, p. 182, pl. P, fig. 47. Godfrey, Journ. Siam Soc., Nat. Hist. Suppl., vii, (4), 1930, p. 350.

Perak: Batang Padang, Jor Camp 1,800 feet, August 25th, 1922 (E. Seimund).

XXVI. SOME LYCAENIDAE NEW TO THE MALAY PENINSULA.

By H. M. PENDLEBURY *and* A. S. CORBET.

Niphanda asialis (Nic.)

Azanus asialis de Nicéville, Journ. Bombay Nat. Hist. Soc., X, 1895, p. 33.

♀. Upperside: both wings coloured dull greyish-brown with the distal halves splashed with white as is usual in the females of this genus; the basal portion of the hindwing is faintly scaled with blue. The markings are only slightly darker than the ground but they are fairly distinct as most of them are situated in the whitened portions of the wings. Forewing: the markings consist of a discoidal streak, a discal band (not 1 mm. wide), composed of contiguous spots, which is outwardly convex but is broken at vein 3 as the spot in space 2 is shifted inwards, a submarginal line which can just be traced, and a series of marginal spots of which that in space 2 is the most prominent. Hindwing: two irregular post-discal lines can be traced and there is a series of rounded, blackish, marginal spots of which those in spaces 2 and 3 are largest and blackest. Almost all the upperside markings are more or less distinctly outlined in white. Cilia grey-brown but whitish in some places.

Underside: both wings pale greyish-brown but darker at the wing bases and whiter near the distal margins. All the markings are defined with white. Forewing with a blackish streak at the base of the cell and lying against the subcostal vein, and it is joined to a rather large and somewhat irregular black patch at the base of space 1; a black, oval spot in the middle of the cell and the cell is closed by a short dark stripe less than 1 mm. wide; a distal band composed of six round spots is broken at vein 3 (the spot in space 2 being shifted inwards); there is a regular submarginal line and a marginal line comprising a number of contiguous spots, all of which are faint except that in space 2 which is the largest and blackest. Hindwing with two prominent, rounded, black spots in space 7, one being situated near the base and the other midway along the costa, another black spot near the base of space 6, a pale round spot in the middle of the cell, a short stripe closing the cell, a small spot at the base of space 1c, a series of discal spots arranged in an irregular manner and a series of marginal spots inwardly edged with white. Of these marginal spots those in spaces 1a and 1b are small and hardly darker than the ground, those in spaces 1c, 2 and 3 are large and black and those in spaces 4, 5 and 6 are rather darker than the ground colour; the spot in space 6 is largest and most prominent. Cilia whitish, with a fine, brown anteciliary line.

Antennae dark brown above but white ringed beneath; both black above but whitish below; legs pale brown with white dusting. Expanse, 23 mm.

The neallotype and only known female of the species was taken on the sea shore at Port Dickson, Negri Sembilan, Federated Malay States, on 18th November, 1932 (H. M. Pendlebury).

L. de Nicéville described the species from a male taken in the Battak Mountains, Sumatra, in 1894; Fruhstorfer (Seitz, Macrolep. ix, 1923, p. 895) mentions a male from Nias but these appear to be the only known examples. The female described above is definitely a *Niphanda* and not *Azanus* for veins 11 and 12 on the forewing are free and not anastomosed. We believe the female to be de Nicéville's species and not *Niphanda marcia* Fawc., for the following reasons: the British Museum has a male and female of *N. marcia* taken on the same day in February 1925 at Ataran, Burma, by Brigadier W. H. Evans. A male of this species from Jor Camp, Perak, is practically identical with the Ataran male. The facies of the underside in the Port Dickson female is quite different to that of the Ataran female and yet very similar to de Nicéville's figure of *asialis*. We have no hesitation therefore in referring our female to *asialis* and removing the species to the genus *Niphanda*.

It is possible that our specimen represents a distinct race from the Malay Peninsula but this question only can be decided when further examples have been collected.

Tajuria yajna selangorana ssp. n.

♀. Upperside: both wings coloured azure blue, a purple tinge is visible in a side light. Forewing with the costa to the upper half of the cell, the apex broadly and the distal margin decreasingly, black. Hindwing with the costa and basal margin whitish, apex black, tornal lobe very black and a fine black anteciliary line. Of the two tails (vein 1, 4 mm. long; vein 2, 4 mm. long) both are black and white-tipped. Cilia black.

Underside: both wings pale greyish-brown but with a distinct reddish tinge. Forewing with a faint whitish discoidal streak, a narrow, post-discal, longitudinal, white stripe (less than 0.5 mm. wide), inwardly edged with reddish-brown, extends almost from the costa of the forewing into space 1a, and on the hindwing from vein 8 to the basal margin; this line is approximately straight except in the tornal area of the hindwing where it develops into a series of loops, of which four can be distinguished. On both wings a pale, narrow submarginal band can barely be traced. Hindwing with the tornus blue dusted; a prominent, rather oval black spot in space 2 inwardly crowned with orange-red, the tornal lobe black and defined on the innerside with some silvery greenish-blue scales. A fine, black anteciliary line, inwardly edged with white, runs along the wing margin between veins 1 and 3: here the cilia is white but pale grey-brown otherwise. The black tails tipped with white.

Antennae black above and tipped with reddish-brown; beneath black and narrowly ringed with white. Body black above with pale grey hairs and whitish below. Legs white and prominently ringed with black. Expanse, 32–34 mm.

The holotype from Bukit Kutu (3,300 feet), Selangor, F.M.S., 25th September, 1932 (H. M. Pendlebury). A second example (♀) taken two days earlier at the same locality does not differ.

The details of the markings on the underside are so similar to those present in the three known races of *yajna* (*yajna* Doh., Mussoorie-Kumaon; *istroidea* Nic., Sikkim-Assam; and *ellisi* Evans, North Shan States) that we have no reasonable doubt that *selangorana* constitutes a very distinct race of that rare species: it differs principally in the broader white discal band and greyer ground colour on the underside. The male of *selangorana*, which is at present unknown, should have the upperside of the forewing black.

Rapala nissa pahangana ssp. n.

♀. Nearest to *R. nissa nissoides* Swinh., from Burma, but differs from it in the following respects: the steely blue upperside is paler and brighter, and, on the underside, the post-discal band on both wings is somewhat convex at the wing centres, and the hindwing black tornal spots are larger. The specimen before us has the rosy-washed underside referable to form *rosacea* Nic. Expanse, 34 mm.

The female holotype from Fraser's Hill 4,200 feet, Pahang, F.M.S., 5th July, 1931 (H. M. Pendlebury).

In general appearance the Malayan example differs so definitely from the Burmese subspecies that we feel justified in taking it as the type of a new race. L. de Nicéville and Martin (Journ. Asiat. Soc. Bengal, LXIV, 1895, p. 483) mention two females taken in the Battak Mountains in Sumatra in 1893, but we have not seen these specimens.

Virachola malaya sp. n.

♀. Upperside: both wings unmarked and coloured a steely, purple blue. The black hindwing lobe is centred with green metallic scales: the tail at vein 2 is black. Cilia brown.

Underside: both wings coloured purple brown with darker brown markings which are outlined with white. The wing pattern strongly recalls that of an *Amblypodia* but there are only two cell spots. Forewing markings are: a large spot in the centre of the cell, a spot of the same size closing the cell, a post-discal band composed of conjoined ovate spots, of which those in spaces 3 (much) and 6 (slightly) are out of line and shifted inwards, and obscure submarginal and marginal bands composed of conjoined spots. Hindwing with three prominent basal spots of which that in space 7 is the largest while those at the base of the cell and in the centre of space 1a are smaller and nearly equal in size. A large spot is placed in the centre of space 7 and the cell is closed by a double quadrate spot; a rather broad post-discal band extending from vein 6 to vein 1a is twice broken as the spots in spaces 3 and 1c are shifted inwards. An obscure series of submarginal spots can be traced; there is a small black tornal spot in space 2, green metallic scaling in space 1c and the black lobe is inwardly white edged. Tail black. Cilia brown.

Antennae dark brown above and white ringed below; body greyish-brown above and buff beneath; legs buff. Expanse 33 mm.

The female holotype from Bukit Kutu (2,500 feet), Selangor, F.M.S., on 9th September, 1910.

The example described in the only specimen known to us. It is nearest to *Virachola smilis* Hew., but so different in general appearance that its specific identity cannot be questioned. It is worth mentioning that we have recently examined a female *V. smilis* obtained at Bukit Kutu (3,300 feet, September 24th, 1932) by H. M. Pendlebury.

The species described is a *Deudorix* or a *Virachola* for, on the forewing, veins 6 and 7 separate from a point whilst veins 11 and 12 are parallel and separate. We are unable to say if the male has any secondary sexual characters but we prefer to regard the species as a *Virachola* on account of its affinity to *V. smilis*.

With regard to the venation nomenclature in the above descriptions we have followed Brigadier W. H. Evans in "Identification of Indian Butterflies," 2nd Ed., 1932.

XXVII. SOME LITTLE KNOWN OR APPARENTLY UNRECORDED LYCAENIDAE AND HESPERIIDAE FROM THE MALAY PENINSULA.

By BRIGADIER W. H. EVANS, C.S.I., C.I.E., D.S.O.

Gerydus gaesa Nic.

Gerydus gaesa de Nicéville, Journ. Bombay Nat. Hist. Soc., X, 1895, p. 26, pl. S, fig. 16.

Gerydus learchus gaesa Fruhstorfer in Seitz, Macrolepid., IX, 1915, p. 816.

Pahang: Kuala Tahan, August 16th, 1921 (E. Seimund); Wray's Hill 1,500–2,000 feet, February 2nd, 1923 (H. M. Pendlebury). Negri Sembilan: Bukit Tangga, 1,200 feet, September 1915.

Gerydus gaetulus Nic.

Gerydus gaetulus de Nicéville, Journ. Asiat. Soc. Bengal, LXIII, 1894, p. 24, pl. V, fig. 12. Fruhstorfer in Seitz, Macrolepid. IX, 1915, p. 820.

Selangor: Kuala Lumpur, October 3rd, 1921 (H. M. Pendlebury).

Lycaenopsis akasa catullus Fruh.

Polyommatus akasa Horsfield, Cat. Lep. Ins. Mus. E.I.Co., (i), 1828, p. 67.

Lycaenopsis catullus Fruhstorfer, Stettiner Ent. Zeit., 71, 1910, p. 283.

Lycaenopsis akasa catullus Fruhstorfer in Seitz, Macrolepid., ix, 1922, p. 862.

Pahang: Cameron Highlands, Tanah Rata 4,800 feet, 1923, 1924, 1931, Sungei Renglet 3,500 feet, 1925, March, May, June, September. Fraser's Hill 4,000 feet, May, July, 1931, 1932 (all H. M. Pendlebury).

Lycaenopsis quadriplaga nearcha Fruh.

Lycaena quadriplaga Snellen, Tijdschr. Ent. 35, 1892, p. 143.

Lycaenopsis quadriplaga nearcha Fruhstorfer in Seitz, Macrolepid., IX, 1922, p. 876.

Pahang: Gunong Tahan 5,500 feet, December 19th, 1921, December 15th, 1922, January 3rd, 1923; Cameron Highlands, Rhododendron Hill 5,200 feet, June 19th–21st, October 13th, 1923; Fraser's Hill 4,000 feet, May 29th, 1932 (all H. M. Pendlebury).

Lycaenopsis albocoeruleus Mre.

Lycaenopsis albocoeruleus Moore, Proc. Zool. Soc. Lond., 1879, p. 139. Fruhstorfer in Seitz, Macrolepid. IX, 1922, p. 864.

Pahang: Cameron Highlands, Tanah Rata 4,800 feet, January May; Fraser's Hill 4,000 feet, May 1932 (H. M. Pendlebury).

Lycaenopsis corythus Nic.

Lycaenopsis corythus de Nicéville, Journ. Bombay Nat. Hist. Soc. IX, 1895, p. 273, pl. O, figs. 16, 17. Fruhstorfer in Seitz, Macrolepid., IX, 1928, p. 875.

East Coast: Tioman Island, June–July 1916 (H. C. Robinson and C. Boden Kloss).

Lampides talinga (Kheil).

Plebeius talinga Kheil, Rhop. Nias, 1884, p. 29, figs. 32, 33.
Lampides kondulana talinga Seitz, Macrolepid., IX, 1924, p. 906.

Selangor: Bukit Kutu 2,500–3,500 feet, April 14th, 1926, September 14th, 1929 (H. M. Pendlebury).

Pahang: Kuala Tahan 300 feet, November 20th and 25th, 1921 (H. M. Pendlebury).

Nacaduba glauca Snell.

Nacaduba glauca Snellen, Tijdschr. Ent. 35, 1892, p. 142. Seitz, Macrolepid., IX, 1924, p. 916.

Perak: Maxwell's Hill 3,000 feet, June–July 1916, 4,500 feet, 20th February, 1932 (H. M. Pendlebury).

Pahang: Cameron Highlands, 4,800 feet, June 18th, 1923, May 1931; Fraser's Hill 4,000 feet, May 29th, 1932.

Selangor: Bukit Kutu 3,300 feet, September 25th, 1932 (H. M. Pendlebury).

Nacaduba nelides Nic.

Nacaduba nelides de Nicéville, Journ. Bombay Nat. Hist. Soc., X, 1895, p. 280, pl. O, fig. 24.
Nacaduba glauca nelides Seitz, Macrolepid., IX, 1924, p. 916.

Perak: Batang Padang, Jor Camp 1,800 feet, August 19th, September 22nd, 1922 (E. Seimund); May 27th–30th, 1923 (H. M. Pendlebury).

Pahang: Kuala Tahan, March 1921 (E. Seimund).

Nacaduba aluta nanda Nic.

Cupido aluta Druce, Proc. Zool. Soc. London, 1873, p. 349, pl xxxii, fig. 8.
Nacaduba nanda de Nicéville, Journ. Bombay Nat. Hist. Soc., X, 1895, p. 34, pl. S, fig. 23.
Nacaduba aluta nanda Seitz, Macrolepid., IX, 1926, p. 916.

Kedah: Catchment Area near Jitra, April 10th, 1928 (H. M. Pendlebury).

Perak: Batang Padang, Jor Camp 1,800 feet, March 9th, 1925 (H. M. Pendlebury).

Pahang: Kuala Tahan, February 15th, 1921 (E. Seimund).

Selangor: Bukit Kutu, 2,500 feet, April 14th, 1926 (H. M. Pendlebury).

West Coast: Langkawi Is., April 22nd, 1928 (H. M. Pendlebury).

Nacaduba dana Nic.

Nacaduba dana de Nicéville, Journ. Asiat. Soc. Bengal, lii, 1883, p. 73, pl. i, fig. 15. Seitz, Macrolepid., IX, 1924, p. 916.

Pahang: Kuala Tahan.

Nacaduba ni Nic.

Nacaduba ni de Nicéville, Journ. Bombay Nat. Hist. Soc., XIV, 1902, p. 247, pl. FF, fig. 8. Seitz, Macrolepid., ix, 1924, p. 916.

Selangor: Ginting Simpak, June 1st, 1930 (A. S. Corbet); Ulu Klang, April 25th, 1931 (H. M. Pendlebury).

Nacaduba dubiosa sivoka Evans.

Plebeius dubiosa Semper, Journ. Mus. Godeffr., XIV, 1879, p. 159.

Nacaduba sivoka Evans, Journ. Bombay Nat. Hist. Soc., XX, 1910, p. 427.

Nacaduba dubiosa sivoka Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 243.

Perak: Kuala Kangsar.

Pahang: Lubok Tamang, Gunong Terbakar 4,500 feet, June 9th, 1923 (H. M. Pendlebury).

Selangor: Kuala Lumpur, April–October (H. M. Pendlebury).

East Coast: Tioman Id., June–July 1916 (H. C. Robinson and C. Boden Kloss).

Chilades laius (Cr.)

Papilio lajus Stoll in Cramer, Pap. Exot. IV, (27), 1780, p. 62, pl. cccxix, figs. D, E.

Chilades laius Seitz, Macrolepid., IX, 1924, p. 926.

West Coast: Langkawi Islands, April 19th–May 1st, 1928 (H. M. Pendlebury).

Amblypodia albopunctata Hew.

Amblypodia albopunctata Hewitson, Ill. Diurn. Lep., 1869, p. 14e, pl. III, b. figs. 43, 44. Seitz, Macrolepid., IX, 1926, p. 953, pl. 150, b.

West Coast: Langkawi Is., April 25th, 27th, 1928. Kedah: Kedah Peak 2,800–3,300 feet, March 20th, 1928; Catchment Area near Jitra, April 8th, 1928 (all H. M. Pendlebury).

Amblypodia alitaeus mirabella (Doh.)

Amblypodia alitaeus Hewitson, Brit. Mus. Cat. Lycaen., 1862, p. 7, pl. 5, figs. 45, 46.

Arhopala mirabella Doherty, Journ. Asiat. Soc. Bengal, LVIII, 1889, p. 420.

Amblypodia alitaeus mirabella Seitz, Macrolepid., IX, 1926, p. 953.

West Coast: Langkawi Islands, April 22nd–29th, 1928 (H. M. Pendlebury).

Amblypodia agaba Hew.

Amblypodia agaba Hewitson, Cat. Lyc. Brit. Mus., 1862, p. 8, pl. iv, figs. 39 and 40. Seitz, Macrolepid., IX, 1926, p. 956, pl. 150, c.

Perak-Pahang border: between Jor Camp and Lubok Tamang 3,000 feet, October 21st, 1923 (H. M. Pendlebury).

Amblypodia malayica (B. Bkr.)

Arhopala malayica Bethune Baker, Trans. Zool. Soc. Lond., XVII, (i), 1903, p. 71, pl. ii, fig. 2 ♂.

Amblypodia malayica Seitz, Macrolepid., IX, 1926, p. 955, pl. 148, c.

Singapore Id., January 17th, 1922.

Amblypodia avatha (Nic.)

Arrhopala avatha de Nicéville, Journ. Bombay Nat. Hist. Soc., X, 1896, p. 174, pl. T, fig. 34.

Amblypodia avatha Seitz, Macrolepid., IX, 1926, p. 958.

Selangor: Kuala Lumpur, July, August, September 1921; July–September 1922, Dusun Tua, July 1921 (H. M. Pendlebury).

Pahang: Kuala Tahan, November 1921 (F. N. Chasen).

Singapore Island, January 14th, 1926.

Amblypodia bazalus Hew.

Amblypodia bazalus Hewitson, Cat. Lyc. Brit. Mus., 1862, p. 8, pl. IV, figs. 37 and 38. Seitz, Macrolepid., IX, 1926, p. 962.

Kedah: Kedah Peak 3,300 feet, March 14th–18th, 1928 (H. M. Pendlebury).

Perak: Maxwell's Hill 4,000 feet, September 1st, 1928 (J. E. Kempe).

Pahang: Fraser's Hill 4,200 feet, July 4th, 1931 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,300 feet, March 9th, 1931 (H. M. Pendlebury).

Negri Sembilan: Bukit Tangga 1,200 feet, September 1915.

Amblypodia atrax Hew.

Amblypodia atrax Hewitson, Cat. Lyc. Brit. Mus., 1862, p. 13. Seitz, Macrolepid., IX, 1926, p. 965.

Trengganu: Kuala Trengganu, June 15th, 1926 (C. Boden Kloss).

West Coast: Langkawi Ids., April 14th–May 1st, 1928 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,400 feet, August 1915.

Amblypodia ariana Evans.

Amblypodia ariana Evans, Journ. Bombay Nat. Hist. Soc., XXX, 1925, p. 628.

West Coast: Langkawi Ids., December 1916–January 1917 (H. C. Robinson and C. Boden Kloss); April 27th, 1928 (H. M. Pendlebury).

Amblypodia alea Hew.

Amblypodia alea Hewitson, Cat. Lyc. Brit. Mus., 1862, p. 12, pl. VII, figs. 79 and 81. Seitz, Macrolepid., IX, 1926, p. 965, pl. 150B., d.

Amblypodia alea alea Evans, Identific. Ind. Butt. (2nd Ed:) 1932, p. 262, H 49.31, pl. XXVIII (= *selta* Hew. 1869).

Peninsular Siam: Nakon Sri Tamarat, Khao Ram 1,200 feet, February 1922 (H. M. Pendlebury).

Selangor: Bukit Kutu 500 feet, September 10th, 1910.

Amblypodia agelastus Hew.

Amblypodia agelastus Hewitson, Cat. Lyc. Brit. Mus., 1862, p. 12, pl. vi, figs. 61, 62. Seitz, Macrolepid., IX, 1926, p. 965, pl. 150B, e.

West Coast: Langkawi Ids., April 27th, 1928. Kedah: Catchment Area near Jitra, April 5th, 1928. Pahang: Gunong Tahan, (Tangga Duablas) 5,900 feet, December 20th, 1922 (all H. M. Pendlebury).

Amblypodia perimuta Mre.

Amblypodia perimuta Moore, Cat. Lep. Mus. E.I.Co., 1, 1857, p. 42. Seitz, Macrolepid., IX, 1926, p. 965, pl. 148 g.

West Coast: Langkawi Ids., April 27th, 1928 (H. M. Pendlebury).

Selangor: Ampang Reservoir, August 16th, 1931 (H. M. Pendlebury).

Amblypodia adala (Nic.)

Arrhopala adala de Nicéville, Journ. Bombay Nat. Hist. Soc., IX, 1895, p. 282, pl. O, figs. 27, 28, 29. Seitz, Macrolepid., IX, 1926, p. 966. (*Amblypodia*).

Differs from Burmese specimens in lacking the purple glaze or gloss below. A very different race.

Kedah: Kedah Peak 3,300 feet, March 17th–20th, 1928 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,400 feet, September 1918.

Amblypodia epimete duessa (Doh.)

Amblypodia epimete Staudinger, Iris, ii, 1889, p. 128, pl. ii, fig. 2.

Arhopala duessa Doherty, Journ. Asiat. Soc. Bengal, LVIII, 1889, p. 419, pl. xxiii, fig. 6.

Amblypodia epimeta duessa Seitz, Macrolepid., IX, 1926, p. 965, pl. 150 g.

West Coast: Langkawi Ids., April 27th, 1928 (H. M. Pendlebury).

Amblypodia fulla Hew.

Amblypodia fulla Hewitson, Fat. Lyc. Brit. Mus., 1862, p. 10, pl. vi, figs. 67, 68. Seitz, Macrolepid., IX, 1926, pl. 148, g.

West Coast: Pulau Rumpia, March 21st, 1926 (E. Seimund).

Pratapa ctesia (Hew.)

Camena ctesia Hewitson, Ill. Diurn. Lep., 1862, p. 48, pl. xx, figs. 1, 2. Seitz, Macrolepid., IX, 1926, p. 971, pl. 155, d.

Pratapa ctesia Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 279, H 59.3, pl. XXIX.

Perak: Larut Hills 4,500 feet, February 12th, 1932 (H. M. Pendlebury).

Pahang: Gunong Tahan 5,600 feet, December 21st, 1922; 4,600 feet, February 2nd, 1923 (H. M. Pendlebury).

Pratapa deva (Mre.)

Amblypodia deva Moore, Cat. Lep. E.I.Co., 1857, p. 46.

Camena deva Seitz, Macrolepid., IX, 1926, p. 971.

Pratapa deva Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 280, H. 59.5, pl. XXIX.

West Coast: Langkawi Islands, April 27th, 1928 (H. M. Pendlebury).

Kedah: Kedah Peak 3,950 feet, March 9th, 1928 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,000–3,450 feet, April 14th–17th, 1926, March 10th–21st, 1931. September 7th–29th, 1932 (all H. M. Pendlebury).

Pratapa icetoides (Elw.)

Camena icetoides Elwes, Proc. Zool. Soc. Lond., 1892, p. 636, pl. XLIV, fig. 3.

Pratapa icetoides Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 281.

Selangor: Klang Gates, January 8th, 1924 (H. M. Pendlebury) 1 ♂, exp. 24 mm.

Pratapa cleobis (Godt.)

Polyommatus cleobis Godart, Entyel. Meth, ix, 1823, p. 634.

Tajuria cleobis Seitz, Macrolepid., IX, 1926, p. 975, pl. 156, c.

Pratapa cleobis Evans, Identific. Ind. Butt., (2nd Ed.) 1932, p. 281.

Kedah: Kedah Peak 3,300–3,950 feet, March 11th–27th, 1928.

Pahang: Lubok Tamang, Gunong Terbakar 4,500 feet, June 9th, 1923.

Selangor: Bukit Kutu 3,300–3,500 feet, March 19th, 1931, September 25th, 1932 (all H. M. Pendlebury) 7 ♂♂, expanse 31–38 mm. 1 ♀, expanse 36 mm.

Pratapa blanka argentea (Auriv.).

Tajuria blanka de Nicéville, Journ. Asiat. Soc. Bengal, LXIII, 1894, p. 39, pl. IV, fig. 4 ♀.

Tajuria argentea Aurivillius, Ent. Tijdschr., XVIII, p. 146.

Pratapa blanka argentea Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 280.

Perak: Batang Padang, Jor Camp 1,800 feet. March 1915 (C. B. Holman Hunt), August 20th, 1922 (E. Seimund).

Singapore: Thomson Road, November 24th, 1920.

Tajuria cretheus (Nic.)

Camena cretheus de Nicéville, Journ. Bombay Nat. Hist. Soc., IX, 1895, p. 294, pl. P. fig. 35 ♂. id: X, 1896, p. 175, pl. T, fig. 35 ♀.

Camena ister cretheus Seitz, Macrolepid., IX, 1926, p. 971, pl. 155, b.

Selangor: Bukit Kutu 3,300–3,500 feet, April 16th, 1926, September 25th, 26th, 1932 (H. M. Pendlebury) 2 ♂♂, expanse 31 mm. 1 ♀, expanse 34 mm.

Tajuria luculentus nela Swinh.

Iolaus luculentus Leech, Ent. XXIII, 1890, p. 38. Butt. China, 1893, pl. XXX, fig. 13.

Tajuria nela Swinhoe, Ann. Mag. Nat. Hist. (6), XVII, 1896, p. 359.

Tajuria luculentus nela Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 285.

Pahang: Cameron Highlands 4,800 feet, January 29th, 1924 (M. R. Henderson).

Charana jalindra burbona (Hew.)

Amblypodia jalindra Horsfield, Cat. Lep. Mus. E.I.Co., 1829, p. 109.

Tajuria burbona Hewitson, Ill. Duirn. Lep., 1869, Supp. p. 24, pl. iii a, fig. 95.

Tajuria jalindra burbona Seitz, Macrolepid., IX, 1926, p. 973.

Selangor: Gombak Valley, October 12th, 1921 (H. M. Pendlebury); Bukit Kutu 3,300–3,500 feet, September 23rd, 1932. Negri Sembilan: Bukit Tangga, July 22nd, 1910. 1 ♂, expanse 39 mm. 2 ♀♀, expanse 35–41 mm.

Charana mandarinus (Hew.)

Myrina mandarinus Hewitson, Ill. Diurn. Lep., 1863, p. 28, pl. XI, figs. 6, 7.

Tajuria mandarina Seitz, Macrolepid., IX, 1926, p. 973, pl. 155, f.

Charana mandarinus Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 286 (H. 61.2) pl. XXIX.

Selangor: Bukit Kutu 3,500 feet, September 7th, 1929 (H. M. Pendlebury) 1 ♀, expanse 47 mm.

Chliaria othona (Hew.)

Hypolycaena othona Hewitson, Ill. Diurn. Lep., 1865, p. 50, pl. XXII, figs. 17, 18.

Chliaria othona Seitz, Macrolepid., IX, 1926, p. 980.

Pahang: Lubok Tamang, Gunong Terbakar 4,500 feet, June 9th, 1923 (H. M. Pendlebury); Cameron Highlands 4,800 feet, September 5th, 1922 (E. Seimund).

Horaga viola Mre.

Horaga viola Moore, Proc. Zool. Soc., 1882, p. 248. Seitz, Macrolepid., IX, 1926, p. 982.

Differs from normal in showing dull blue scaling the inner part of the disc of the fore and hindwings above.

Kedah: Kedah Peak 3,950 feet, March 21st, 1928 (H. M. Pendlebury). 1 ♂, expanse 24 mm.

Horaga araotina sp. n.

♀. Forewing rounded; hindwing with ciliate tails at the ends of veins 1, 2, and 3, (tail at 2 broken) tails at 1 and 3 white, 2½ mm. long. Termen deeply indented at vein 4 as in *Rathinda*.

Upperside: uniform dark brown, hindwing with a white tornal area from 1c–3, divided by dark veins and separated from the termen by large dark spots.

Underside: bright ochreous brown, forewing with a narrow, straight, central white band from vein 1 to upper end of cell. Hindwing with the outer two thirds white except for the apex; a large quadrate dark brown spot at end of cell; an irregular, curved, discal macular band and submarginal spots, the tornal spot being metallic green.

Length of forewing, 13½ mm.

Selangor Coast: Pulau Angsa. 1 ♀.

This is a curious insect which at first sight might be taken for an aberrative *Araotes lapithis*, but it falls in the widely removed genus *Horaga*, and is unlike any *Horaga* known to me. On principle I do not like describing species from a single female specimen, but this one, although slightly damaged, is so peculiar that it is worthy of remark.

Marmessus lisias boisduvali (Mre.)

Papilio lisias Fabricius, Mant. Ins. ii, 1787, p. 65.

Drupadia boisduvali Moore, Journ. Asiat. Soc. Bengal, LIII, 1884, p. 31.

Marmessus lisias boisduvali Seitz, Macrolepid., IX, 1926, p. 98 a, pl. 159, c.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram 300–750 feet, February–March 1922, Khao Luang 2,000 feet, March 1922 (H. M. Pendlebury). Patalung, Na Wongse, May 1924 (I. H. N. Evans).

West Coast: Langkawi Ids., April 15–30th, 1928 (H. M. Pendlebury).

Kedah: Kedah Peak 3,300–3,900 feet, March 25th, 1928 (H. M. Pendlebury).

Artipe eryx (L.)

Papilio eryx Linnaeus, Mant. ii, 1771, p. 537.

Deudorix eryx Seitz, Macrolepid., IX, 1926, p. 1001.

Artipe eryx Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 294 (H. 82) pl. XXIX.

Selangor: Kuala Lumpur, July 14th, 1914 (Ex. coll. Agric. Dept.). 1 ♀, defective, expanse 48 mm.

Rapala varuna (Hsf.)

Thecla varuna Horsfield, Cat. Lep. Mus. E.I.Co., 1829, p. 91.

Rapala varuna Seitz, Macrolepid., IX, 1926, p. 1004.

Pahang: Kuala Tahan, November 15th, 1921 (F. N. Chasen).

Selangor: Ulu Langat, January 12th, 1930; Kuala Lumpur, May 1st, 1926, June 6th, 1927 (H. M. Pendlebury).

East Coast: Tioman Id., June–July 1916 (H. C. Robinson and C. Boden Kloss).

Rapala schistacea (Mre.)

Deudorix schistacea Moore, Proc. Zool. Soc. Lond., 1879, p. 140.

Rapala schistacea Seitz, Macrolepid., IX, 1926, p. 1005, pl. 146, a.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram 750–1,200 feet, February 25th, 1922 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,400 feet, September 1915.

Rapala abnormis Elw.

Rapala abnormis Elwes, Proc. Zool. Soc., 1892, p. 642, pl. XLIV, fig. 2. Seitz, Macrolepid., IX, 1926, p. 1007.

Pahang: Cameron Highlands, Rhododendron Hill 5,200 feet, June 18th, 1923 (H. M. Pendlebury).

Selangor: Bukit Kutu 3,300–3,400 feet, March 12th–16th, 1931, September 25th, 1932 (H. M. Pendlebury).

Cyaniriodes libna andersoni (Mre.)

Hypolycaena libna Hewitson, Ill. Diurn. Lep., Suppl., 1869, p. 15, pl. V, figs. 39, 40.

Logania andersoni Moore, Journ. Asiat. Soc., Bengal liii, 1884, p. 22.

Cyaniriodes de Nicéville, Butt. Ind. iii, 1890, p. 33.

A very rare butterfly.

Pahang: Kuala Tahan, March 1921, 1 ♂.

ADDENDA.

Delete **Amblypodia atrax** Hew. (p. 409), which has been recorded already under *mindanensis* B. Bkr.

Add **Surendra florimel** Doh.

Surendra florimel' Doherty, Journ. Asiat. Soc. Bengal, lviii, (2), 1889, p. 424, pl. 23, figs. 17, ♂, 4, ♀. Seitz, Macrolepid., ix, 1926, p. 943, pl. 150 a.

Perak: Batang Padang, Jor Camp, 1,800 feet, August 1922 (E. Seimund).

Pahang: Kuala Tahan, March 1921. Singapore: Pulau Ubin, September 1921, (F. N. Chasen).

Family HESPERIIDAE.

A revision of the list of Malayan Hesperiidae has necessitated a few additions and alterations being made to certain of the species mentioned in my "Identification of Indian Butterflies." (Second Edition) 1932.

Subfamily ISMENINAE.

Choaspes plateni Stgr., has been found to be conspecific with *C. stigmata* Evans, and hence has priority. A new record for the Malay Peninsula is:

Choaspes hemixanthus furcata Evans.

Choaspes hemixanthus Rothschild and Jordan, Novit. Zoolog., x, 1903, p. 482, pl. xi, fig. 3.

Choaspes plateni furcata Evans, Identific. Ind. Butt., (2nd Ed.) 1932, p. 321.

Perak: 1 ♂ in Brit. Mus.

Subfamily CELAENORRHINAE.

It has been found that *Celaenorrhinus leucocera* Koll. and *C. putra* Mre., are distinct species and only the latter is known with certainty from Malaya.

The type of *Tagiades gana* Mre. has been ascertained to have originated from Java and not from Sikkim, and is conspecific with *T. avala* Fruh.; the oldest name for what has hitherto been regarded as *T. gana* (*e.g.* by Swinhoe, Seitz, and Evans) is *T. parra* Fruh.

T. ravi Mre. and *T. utanus* Pl. were united formerly under *atticus* F., but the type of the last named has been lost, and it appears best to discard the name. Both the forms *ravi* and *utanus* occur in Malaya: in *ravi* the hindwing is whitish below, and the ♀ has large discal spots on the forewing; *utanus* is brown below and the ♀ has small spots on the forewing.

New records for the Malay Peninsula:—

Tagiades litigiosa ultra Evans.

Tagiades litigiosa Möschler, Verh. Zool.-Bot. Wien, xlviii, 1878, p. 230.

Tagiades litigiosa ultra Evans, Identific. Ind. Butt. (2nd Ed.) 1932, p. 335.

British Museum (Natural History) 13 ♂♂, 2 ♀♀.

Tagiades menaka manis ssp. n.

Typical *T. menaka* Mre. occurs from North India to mid Burma, Siam, and Hainan in two forms which differ on the hindwing above: one form has the marginal spots large and conjoined, the other small and well separated.

The new race resembles the second form, but differs in the following respects: the discal spot in 3 is conjoined to the large spot in 4.5, and veins 3 and 4 are more or less darkened near the spot; the white area does not extend into space 6.

Pahang: Sungei Bertam 4,800 feet (type ♂ in British Museum). Cameron Highlands 4,800 feet, ♂. Selangor: Bukit Kutu 3,300 feet, 2 ♀♀.

Tagiades cohaerens cinda ssp. n.

T. cohaerens Mab., is a Formosan species resembling *menaka* generally, but having very different genitalia; the species has been found to extend in a modified form to China and Burma. *T. cohaerens* on the hindwing above has the marginal spots conjoined, and the discal spots in 1c and 3 are also conjoined by a ragged band.

In the new race the marginal spots are small and separate, the discal band in 1c is as in *menaka*, but otherwise the discal band of *cohaerens* is only represented by a small spot on vein 3 (not in space 3 as in *menaka*) caused by the thickening of the dark vein colouring. On the hindwing below, the cell spot below the origin of vein 6 which is a prominent feature in *menaka* and *cohaerens* is vestigial in *cinda*.

Pahang: Fraser's Hill 4,000 feet, type ♂ in British Museum. Two other males from the same locality.

Subfamily HETEROPTERINAE.

A former record for *Ampittia maga* Leech from the Malay Peninsula depends on 2 ♀♀ from "Arizan, Ozaki." There is no such locality in Malaya and so the species can be omitted from the list. A further study of the genus *Notocrypta* has called for certain alterations in nomenclature, and the Malayan species are as follows: *N. quadrata* Elw. and Ed., *N. pria* Drc., *N. volux devadetta* Fruh., *N. volux asawa* Fruh. (Langkawi Ids.), *N. curvifascia* Feld., and *N. feisthameli alysos* Mre.

A new record for the Malay Peninsula is:—

Suastus rama rama (Mab.)

Pamphila rama Mabille, Bull. Soc. Ent. France, 1876, p. 198.

Suastus rama rama Evans, Identific. Ind. Butt. (2nd Ed.) p. 365 (= *sala* Auctt. nec Hew.).

West Coast: Langkawi Ids., April 28th, 1928 (H.M.P.) 1 ♂.

Subfamily PAMPHILINAE.

Several changes in the genus *Padraona* have been made at the British Museum after examination of Mabille's and Fruhstorfer's types. *P. phellus* Mab. must be removed from the list, so the Malayan species are: *P. rectifasciata* Elw.

and Ed., *P. maesoides maesoides* Btlr., *P. ganda* Fruh. (= *trachala* Evans, nec Mabille), *P. pseudomaesa copia* Evans, *P. trachala ino* Evans, *P. juno* Evans, *P. tropica tropica* Pl., and the following two new records:

Padraona palnia palnia (Evans).

Telicota palnia Evans, Journ. Bombay Nat. Hist. Soc., xxiii, 1914, p. 309.

Padraona palnia palnia Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 403.

British Museum: 2 ♂♂.

Padraona serina (Pl.)

Hesperia serina Plötz, Stett. Ent. Zeit., xliv, 1883, p. 231. (Mexico, ? err. loc.).

Padraona serina serina Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 404.

British Museum: 2 ♂♂.

The generic name *Astycus* Scudd., (Identific. Ind. Butt. (2nd Ed.) 1932, pp. 312,404,405), has been found to be preoccupied, so *Telicota* Mre. must be used.

Oriens gola (Mre.)

Pamphila gola Moore, Proc. Zool. Soc. Lond., 1877, p. 594, pl. 58, fig. 9.

Oriens gola Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 400.

Described from the S. Andamans.

Oriens goloides (Mre.)

Padraona goloides Moore, Lep. Ceylon, i, 1880–1881, p. 171, pl. 71, figs. 3, 3a.

Oriens gola goloides Evans, Identific. Ind. Butt. (2nd Ed.), 1932, p. 400.

Described from Ceylon.

These two forms have been regarded generally as conspecific, if not identical. On examining the British Museum material it was found that all specimens from South India and Ceylon have the uncus (seen from the side) greatly twisted which typical *gola* (Andamans) has not. It was found further that *goloides* occurred with *gola* throughout North-East India, Burma, and Malaya, *gola* extending on through Malaysia. Superficially the two species, as they must be viewed, can be separated by the markings on the upperside being divided by brown veins in *goloides* and not in *gola;* females are readily distinguished, while in the male the best character is the brown cell spot on the forewing which is distinctly separated from the discal band in *goloides.* Typical *gola* from the Andamans is on the average slightly smaller than continental (*e.g.* Malayan) specimens which may be regarded as appertaining to the subspecies *rajagriha* Fruh., described from Sumatra. In the British Museum there are from Malaya 2 ♂♂ and 3 ♀♀ of *goloides,* and 6 ♂♂ and 1 ♀ of *gola rajagriha.*

XXVIII. NEW SPECIES OF MUTILLIDÆ (HYMENOPTERA, VESPOIDEA) FROM THE MALAY PENINSULA.

By H. T. PAGDEN, M.A.

(With twenty-one text figures).

During four years residence in the Malay Peninsula I devoted my spare moments and local leave to collecting and observing Aculeate Hymenoptera, paying particular attention to the Mutillidæ. In assembling this collection I was particularly fortunate in being stationed in the Krian District of Perak, an area which has been practically unexamined entomologically except from a strictly agricultural point of view. My work entailed a considerable amount of travelling, particularly on foot through padi fields, and I was often able to collect a number of Mutillidæ on the paths along the irrigation distributaries and drains and not infrequently obtained specimens *in copula* on grasses in these situations. I was further fortunate in having access to the Bukit Panchor Reservoir, Bandar Baharu, Kedah, through the kindness of my friend Mr. R. P. Kelly.

Most of the material dealt with in the following pages has been killed with ethyl acetate and the males pinned with stainless steel pins; most of the females have been staged on triangular pieces of card the points of which have been bent down and attached to the concavity of one side of the thorax by means of celluloid dissolved in ethyl acetate. For this method of carding I am indebted to Dr. G. Salt.

Where time permitted the male genitalia have been extracted while fresh and mounted in Canada balsam after treatment with potassium hydroxide,

In the description of new species I have endeavoured to follow Professor Mickel, whose work on Mutillidæ is too well-known to need comment, and while I cannot hope to approach the very high standard which I have tried to follow, I trust that it will make for greater uniformity than would otherwise have been the case. The descriptions which I have drawn up are perhaps rather long and laborious to read but I feel that with a group like the Mutillidæ, where there are many species which closely resemble each other in one or both sexes, it is preferable to err on the side of prolixity rather than of brevity. I have however endeavoured to incorporate the salient characters which may seen easily in a brief description of each sex before proceeding to the full description.

In my examination I have found that all the males of *Trogaspidia* which I have described have nearly identical sculpturation of the metanotum and pleural areas, while in the females the clypeus is very similar throughout, and the general form of the pleurites of the thorax is the same.

While it is improbable that any of these species have been described previously, I realise that there is a considerable number of descriptions that I have been unable to examine. In deciding this question I have examined all the types and authentically named species of Malaysian material in the British Museum of Natural History and the Smith and Cameron types at Oxford; I have also consulted with Professor Bischoff and visited the Zoologisches Museum der Universität in Berlin and my material has been looked over by Professor C. E. Mickel.

The descriptions that follow were drawn up at a magnification of 20 x. except for the clypeus which was 40 x. All measurements were made at 40 x.

I take great pleasure in acknowledging the help and encouragement which I have received from Professor Bischoff of the University Museum of Zoology in Berlin and Professor C. E. Mickel of the Univerity of Minnesota. To Mr. H. M. Pendlebury of the Selangor Museum, Kuala Lumpur, F.M.S. I am indebted for the loan of the whole of the Museum collection of Mutillidæ from Malaya, Siam and Borneo. The Bornean material is being dealt with by Professor Mickel and it is only because he was unable to devote the time to the Malayan species at present that I have ventured to deal with some of them myself. For other specimens I am indebted to Mr. N. C. E. Miller of the Department of Agriculture, S.S. & F.M.S., Mr. R. P. Kelly of the Public Works Department, and Enche' Razali, Assistant Artist in the Department of Agriculture. I have to thank the authorities of the British Museum of Natural History for many facilities granted to me and also Professor E. B. Poulton, F.R.S., for allowing me to examine the F. Smith and P. Cameron types in the Hope Department of Entomology, Oxford.

To Mr. F. R. Parrington, Department of Zoology, Cambridge, I am grateful for the loan of the apparatus with which the photographs of pygidial areas, heads and views of the thorax were obtained and for his assistance in taking these. This apparatus consisted of a Leitz low power binocular microscope and camera attachment.

The photographs of genitalia were kindly taken for me by Mr. J. Williams, Vernham, West Byfleet, Surrey with a Watson f.6.5 Holostigmat Photo-Micro lens and Ilford Infra-Red plates.

I am particularly indebted to Mr. W. E. Watson Baker, of W. Watson & Sons, Ltd., for his kindness in loaning me the above mentioned lens.

Family Mutillidæ.

Timulla (Trogaspidia) pendleburyi sp. n. (Figs. 1, 2).

Male.—Head and thorax, extreme base of first tergite, apical two-thirds of fourth tergite and sternite and the whole of the last three abdominal segments, and the first sternite, black; apical two-thirds of the first, the whole of the second and third, and the basal third of the fourth tergites, and the second and third sternites, ferruginous; mandibles with a pre-apical ferruginous cloud, the inner tooth blunt; median area of clypeus pentagonal in outline, with a broad, median, longitudinal elevation, sharply truncate at the apex, the submarginal punctate furrow wide and coarse; antennal scrobes carinate above, the carina continued on the outer margin of the tubercles; tegulæ piceous, jet black anteriorly; scutellum elevated and with a short, median, longitudinal, glabrous ridge on its anterior face; second tergite and sternite not at all gibbous; seventh tergite with a median, lanceolate, tumaceous area, widest posteriorly, the hypopygium micro-rugulose and sub-nitent; hypopygial ridges feebly developed on the basal half of the hypopygium. Wings fuscous and iridescent. Length 18 mm.

Head black, except the mandibles with a clear ferruginous subapical cloud; mandibles simple at the apex, with a blunt subapical tooth on their inner margin, emarginate and with a blunt tooth near the base posteriorly; clypeus with sparse, pale pubescence laterally and surrounding the median area; lateral areas obliquely rugulose-striate; median area pentagonal, glabrous, the median elevation broad, more than one-third the width of the whole median area, abruptly truncate apically; submarginal furrow broad, rugulose, foveate laterally where the polished surface encroaches in a narrow wedge, forming two lateral arms to the furrow; median area with a few, fine punctures laterally and basally; margin transverse; antennal scrobes distinctly carinate above, the carina continued round the outer and anterior margin of the antennal tubercles; scape distinctly bicarinate beneath, with a few, fine, piliferous punctures in the apical two-thirds, more closely punctate dorsally, clothed with sparse, pale pubescence; pedicel three-eighths as long as the first flagellar segment which is about equal to the third; frons laterally punctate, the punctures fine, shallow, and confluent in the emargination of the eyes; vertex lateral to the ocelli with a few, large, sub-confluent punctures and a clear, polished, lunate space behind the ocellar area laterally; vertex and genæ with finer confluent punctures; ocellar area moderately elevated, punctate; distance of lateral ocelli from the eyes equal to one and three-sevenths of their distance from each other and to two-ninths the diameter of the anterior ocellus;

frons below the ocelli clothed with appressed, pale pubescence and scattered, erect, pale hairs, the hairs above and on the vertex dark fuscous; genæ, postgenæ and malar space with sparse, appressed, pale pubescence and scattered, erect, pale hairs; relative widths of head and thorax including the tegulæ 15.6: 19.5.

Thorax black; pronotum rather shallowly reticulately punctate, longitudinally rugose laterally, clothed with sparse, appressed, and scattered, erect, pale pubescence, the pubescence denser posteriorly; mesonotum coarsely and deeply punctate, the punctures longitudinally confluent, with a few erect, piceous hairs anteriorly, the rest sparsely clothed with sub-erect, black pubescence, the parapsidal furrows deep and widened posteriorly; scutellum elevated, coarsely, contiguously punctate, with a glabrous line on the posterior half of the anterior face; dorsal area of propodeon reticulate, defined laterally by a raised glabrous line and with an elongate median area, widened at the base but not terminating in a tubercle on the brow, clothed with appressed pale pubescence and scattered, erect, pale hairs: posterior face of propodeon more finely reticulate and with a median longitudinal carina, clothed with scattered, erect, pale hairs and sparse, pale pile laterally. Convexity of mesepimeron reticulately punctate, of mesepisternum reticulate, both with appressed pale pubescence and scattered, erect, pale hairs. Mesosternum strongly tuberculate on the anterior brow laterally, the tubercle glabrous. Tegulæ large, black, piceous posteriorly, punctate and with black pubescence on the anterior and inner margins, the pubescence golden posteriorly.

Abdomen black and ferruginous, the first tergite black basally, the first sternite wholly black; fourth segment black on the apical two-thirds, the following segments black; posterior two-thirds of first tergite, the whole of the second and third segments and the base of the fourth, ferruginous. First tergite with a glabrous discal area, moderately large foveolate punctures on the face, small and contiguous laterally, very fine apically, clothed with sparse, erect, pale pubescence and with a thin apical fringe of pale pubescence; second tergite with fine, remote punctures dorsally, dense laterally, clothed with scattered, erect, pale pubescence, longer basally, short, sub-erect and darker posteriorly, with a thin apical fringe, the disc glabrous medially; tergites 3–6 with fine, remote punctures above, dense laterally, 4–6 with a band of minute, dense puncturation at the extreme base; third and fourth with scattered, erect, pale hairs and a thin, medially interrupted, apical fringe; fifth with pale hairs basally, black posteriorly; sixth with black hairs, the pubescence erect; seventh with fine, dense punctures, very fine posteriorly, and a median, lanceolate area sub-nitent and microrugulose, widest at the posterior third, clothed laterally and basally with erect black hairs, apically with sub-erect dark fuscous hairs; first sternite with a short, sharp carina on the basal two-thirds, laterally punctate with scattered, pale pubescence: second sternite with moderate, foveolate punctures, scattered pale pubescence and a thin apical pale fringe; sternites 3–6 with fine, distinct, remote punctures, 3–5 with sparse, erect, pale pubescence and a thin apical fringe, 6 with the pubescence darker; seventh sternite with a pair of extreme lateral, glabrous, elongate tubercles, a sub-apical line of fine punctures and a few scattered punctures, the pubescence piceous; hypopygium with minute, close punctures and a few, larger, scattered punctures, the ridges on the basal half widely separated and scarcely elevated, their apices not free, the surface not foveate between the ridges, the apical margin evenly arched, the pubescence piceous, dark fuscous apically.

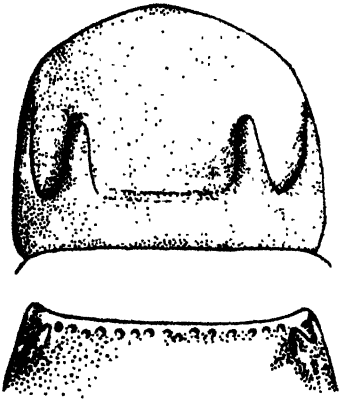

Fig. 1. *Trogaspidia pendleburyi* sp. n. Seventh and Eighth sternites ♂.

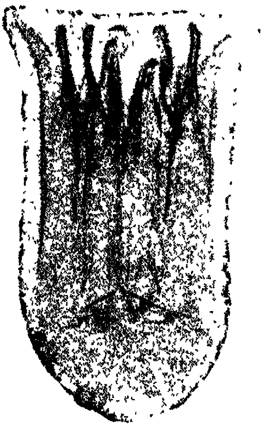

Fig. 2. *Trogaspidia pendleburyi* sp. n. Genitalia, paratype ♂. (No. 1180).

Legs black with sparse, pale pubescence; calcaria pale: a strong transverse carina, medially interrupted, on the metasternum in front of the posterior coxæ; the metasternum medially longitudinally sulcate; posterior coxæ with dense pile inwardly beneath, their inner margins carinate.

Wings dark fuscous, the hind wings paler, decidedly so basally; cell *2nd* $R_1 + R_2$ longer than cell $R +$ *1st* R_1 cell R_5 receiving vein M_{3+4} beyond the middle, about eleven-nineteenths from the base; cell R_4 less distinct, receiving vein M_2 at nine-thirteenths from the base.

Female.—Head, except the mandibles near the base, legs and abdomen, black; thorax ferruginous; second tergite with a pair of small antero-lateral spots of pale, glittering pubescence; third tergite with a broad, entire fascia of pale golden pubescence; pygidial area longitudinally rugulose on the basal two-thirds, the rugulosities finer and divergent posteriorly, extending a little further laterally, the apex micro-shagreened, the area partially obscured by the lateral fringes; second and third sternites with a distinct apical fringe of silvery pubescence; second sternite medially sub-carinate at the extreme base beneath; tooth on the post-lateral margin of the mouth cavity blunt, about half way from the base of the mandibles to the mid-line of the caudal aspect of the head; tubercle on anterior coxæ small. Length 10.7 mm.

Head black, coarsely, longitudinally, confluently punctate and longitudinally ridged on the frons and vertex, clothed with sparse, decumbent, pale pubescence about the scrobes, the rest with sparse, erect, and shorter, sub-erect, black pubescence: occiput with small, shallow punctures and short, fuscous pile as well as erect black pubescence; genæ with moderate, close, confluent punctures and appressed pale pubescence; gula with small, scattered punctures, sparse, appressed and sparse, erect, pale pubescence; posterior margin of head with a thin fringe of pale pubescence; punctures in malar space very shallow; mandibles with a ferruginous cloud near the base, their apices simple but with a small, distinct tooth about two-sevenths from the apex on the inner margin; median pre-apical tubercle of clypeus moderately small, concave above, not overhanging the margin, the margin widely excised; clypeus with appressed pale pubescence laterally, sparse, erect pubescence and few very long hairs medially; scape with a few, small, foveolate punctures and sparse, pale pubescence, somewhat ferruginous apically; pedicel three-sevenths the length of the first flagellar segment, clothed with sparse, pale pubescence; first flagellar segment two and one-third times the length of the second; tooth on gular margin of mouth cavity situated half-way from the base of the mandible to the mid-line, obtuse and inclined forwards. Relative widths of head and thorax 12:11.

Thorax ferruginous, widest anteriorly behind the frontal angles; narrowest in the mesonotal area; coarsely, longitudinally, confluently punctate, clothed with long, erect and short, sub-erect, black pubescence; scutellar scale distinct; brow and lateral angles of propodeon distinctly but finely denticulate; posterior face of propodeon longitudinally rugose, the rugosity obsolete postero-medially where the surface has fine, remote, piliferous punctures, clothed with sparse, erect, pale pubescence; pleura mealy, subnitent and micropubescent, the sides of the propodeon dorsally with remote, fine, shallow punctures; anterior suture of mesepisternum strongly carinate.

Abdomen black; first tergite with moderate, foveolate punctures, finer laterally and posteriorly, the surface micropunctate and micropubescent between the punctures posteriorly, clothed with scattered, erect, pale pubescence and with a thin, apical fringe of black pubescence; second tergite with moderate foveolate punctures, fairly dense, appressed, and scattered, erect, black pubescence, the pubescence pale anteriorly, and with a pair of small anterolateral spots of pale, glittering pubescence, the spots separated by one and one-third times their diameter, the surface very strongly gibbous between the spots; posterior two-thirds of the lateral margin of the second tergite with dense, appressed, pale pubescence extending on to the posterior margin extreme laterally; third tergite finely punctate and with a broad, entire fascia of dense, appressed, pale golden pubescence with scattered, erect, pale hairs; fourth and fifth tergites finely punctate, clothed with moderately dense, erect, black pubescence, that on the fourth pale basally; sixth very closely punctate, with black pubescence at the extreme base medially, the pygidial fringes dense, pale golden; pygidial area longitudinally rugulose on the basal two-thirds, rather more laterally, the rugulosities divergent posteriorly, apical third micro-shagreened, nearly smooth. Posterior angle of carina of first sternite acute, the apical margin undercut, the sclerite tinged with ferruginous, laterally punctate, with scattered, erect, pale pubescence; second sternite polished and shining, with moderate, distinct punctures, fine anteriorly, the anterior margin slightly elevated and medially, longitudinally, subcarinate at the extreme base, clothed with scattered, erect, pale hairs and with a dense apical fringe, widened laterally, of pale pubescence; sternites 3–5 finely punctate, with a few, scattered, erect, pale hairs, the third with a moderately dense fringe of short pale pubescence with some scattered longer pubescence, the fourth and fifth with short, black pubescence and a few. long, pale fuscous hairs posteriorly: hypopygium with small, close punctures and long, sub-erect, pale golden pubescence.

Legs black, clothed with sparse, pale pubescence: tubercle on anterior coxæ small, situated posterior to the middle: second coxæ tinged ferruginous; calcaria pale ochreous; pectinal spines of anterior tarsi ferruginous; tibial spines piceous.

Holotype.—Male, Ampang, Kuala Lumpur, Federated Malay States, 10 January, 1932 (H. M. Pendlebury). *In copula* with female. In coll. Selangor Museum, Kuala Lumpur, Federated Malay States. (To be deposited in Brit. Mus.).

Allotype.—Female, Ampang, Kuala Lumpur, Federated Malay States, 10 January, 1932 (H. M. Pendlebury). Mounted on same pin as male. In coll. Selangor Museum, Kuala Lumpur, Federated Malay States. (To be deposited in Brit. Mus.).

Paratypes.—Selangor, Federated Malay States: female, Ampang Forest Reserve near Kuala Lumpur, 28 October, 1928 (H. M. Pendlebury); male* and female in copula, 12th mile Ulu Gombak, at side of forest path, 28th July, 1929 (N. C. E. Miller).

This species is closely related to *sibylla* Smith, from which it differs mainly in the much more pronounced gibbosity between the spots on the second tergite and in the sculpture of the pygidial area.

Timulla (Trogaspidia) oryzæ sp. n. (Figs. 3–6).

Male.—Head, thorax, apex of sixth and whole of seventh tergite of abdomen, antennæ and legs, black; abdominal tergites one to five, and the basal three quarters of six, red; median area of clypeus triangular in outline. the apex of the triangle proximal, strongly elevated and densely pubescent, its surface flat, the free margin of the clypeus receding, slightly concave and surrounded by a fine carina; scutellum elevated, with a median, longitudinal, glabrous line on its anterior face; hypopygium with a pair of broad, convergent, lateral, glabrous ridges on the basal three-quarters. Length 5.6 mm.

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* This male has had the antennæ, left anterior tarsus and right anterior tibia and tarsus broken and lost in transit.

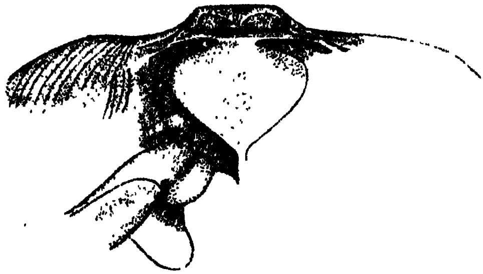

Fig. 3. *Trogaspidia oryzæ* sp. n. Clypeus of ♂. (No. 1878).

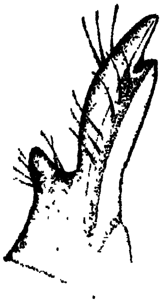

Fig. 4. *Trogaspidia oryzæ* sp. n. Left mandible of ♂. (No. 1878).

Head entirely black, except the mandibles tinged with ferruginous sub-apically and within posteriorly; mandibles simple at the apex but with a well developed sub-apical tooth on their inner margin distal to the ferruginous mark, deeply emarginate beneath and with a strong tooth near the base: clypeus clothed with sparse pale golden pubescence laterally; the triangular median elevation polished and shining with a few scattered punctures laterally and basally, and densely clothed with short pale golden pubescence intermixed with sparse, long, erect hairs of the same colour, its lateral concavity bare and polished; the receding margin transverse, concave, bounded by a fine carina, polished and shining, with small shallow punctures, larger laterally. Scape shining, distinctly bi-carinate beneath, with a few small, scattered punctures between the carinæ, the punctures larger and closer above, the whole moderately densely clothed with pale golden pubescence; pedicel annular, about one third the length of the first flagellar segment, first strongly compressed and flattened above and beneath, about as long as the second; antennal scrobes carinate above, the carina not continued on to the antennal tubercles.

Frons with moderate, close, confluent punctures, the puncturation entirely hidden by dense, appressed, pale golden pubescence, except towards the emargination of the eyes where it is sparse, the punctures clearly visible. Vertex and genæ with moderate, close, almost confluent punctures, those on the genæ finer, sparsely clothed with short, appressed, and long erect, pale golden pubescence, the appressed hairs along the anterior margin of the eyes down to the base of the mandibles, denser, with a few widely-spaced, strong, erect, piceous hairs at the posterior margin of the eyes above. Gula, at the margin of the mouth cavity medially, with a tubercle on either side of the mid-line, and with a short, oblique, curved ridge on its face laterally. Ocellar area moderately raised, the ocelli small, the anterior one larger, distance of lateral ocelli from the eyes about one and one-third times their distance from each other and three times the distances of the anterior ocellus. Relative widths of head and thorax including tegulæ 11.3:14.

Thorax entirely black. Pronotum dorsally densely, confluently punctate, clothed with dense, appressed, pale golden pubescence, densest posteriorly, and with sparse, erect, pale golden pubescence, laterally longitudinally rugose, almost costate, with some sparse, pale pubescence and covered with almost white micropubescence; mesonotum with large, deep and dense, slightly longitudinally confluent punctures, clothed with sparse, sub-erect, black pubescence, with a few golden hairs anteriorly; parapsidal furrows distinct on the posterior five-eighths, deep, and widened posteriorly; scutellum moderately elevated and with a median, raised, glabrous line on the anterior face of the elevation, the apex of the line sub-tuberculate, rest of the scutellum coarsely confluently punctate, clothed with sparse, sub-erect, black pubescence anteriorly, posteriorly with sparse, erect, pale golden pubescence, divided from the mesonotum by a very deep, wide, polished sulcation; dorsum of propodeon twice as wide as long, defined laterally by a raised glabrous line, the surface reticulate, with an elongate median area, widened at the base, twice as long as its basal width and terminating in a low ridge on the brow, the whole dorsal surface clothed with dense, appressed, pale golden pubescence, with some sparse, long, erect, pale golden pubescence laterally; brow of propodeon rather abrupt, sub-carinate; posterior face of propodeon irregularly reticulate and without any clearly defined median carina, sparsely clothed with long, erect, pale golden pubescence laterally and with a few scattered hairs of the same colour on the face. Propectus micropunctate and bare laterally, punctate and micropubescent with sparse, long, erect, pale golden pubescence ventrally; mesepimeron feebly, longitudinally rugose in the anterior concavity, micropunctate and micropubescent and with a few fine punctures on the anterior slope, the convexity reticulately punctate and clothed with dense, appressed, and scattered, erect, pale golden pubescence; mesopleural suture deep, foveolate, finely costate anteriorly; mesepisternum reticulate on the convexity which is clothed with dense, appressed and sparse, erect, pale golden pubescence, the pubescence very dense on the suture, micropunctate and with a few small close punctures anteriorly, posteriorly micropunctate and with a few shallow punctures, finely pubescent; meta-epimeron finely striate dorsally, micropunctate and micropubescent; meta-epimeron micropunctate and micropubescent with moderate, shallow punctures; sides of propodeon except for a micropunctate and micropubescent area along the lower margin, the reticulate portion with scattered, long, erect, pale golden pubescence. Mesosternum coarsely, confluently punctate, clothed with dense, appressed, and sparse, long, erect, pale golden pubescence, armed with a short, transverse, glabrous tubercle anteriorly on either side of the mid-line; tegulæ large, shining and impunctate except the anterior and inner margins with scattered punctures and sub-erect, black pubescence; black, their outer margins piceous.

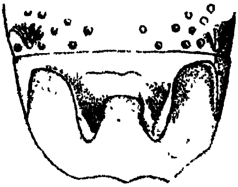

Fig. 5. *Trogaspidia oryzæ* sp. n. Seventh sternite and hypopygium of ♂. (No. 1930).

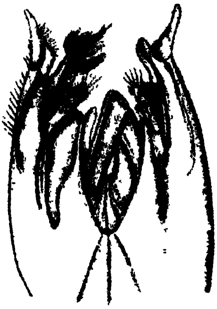

Fig. 6. *Trogaspidia oryzæ* sp. n. Genitalia, paratype ♂. Note the remarkable squamæ.

Abdomen dorsally, except the apex of the sixth and the whole of the last tergite, ferruginous; first tergite with moderately close punctures, smaller and closer laterally, clothed with sparse, erect, pale pubescence and with an apical fringe of pale golden pubescence; second tergite somewhat gibbous, the gibbosity impunctate, with moderately small, close punctures basally and laterally, the punctures more scattered towards the middle and medio-posteriorly, sparsely clothed with erect, pale pubescence, shorter and more golden posteriorly, and with a thin apical fringe of golden hairs; lateral pubescent line with reddish golden hairs; tergites 3–6 transversely micro-striate at the base, with small distinct punctures, the puncturation narrowly interrupted medially, clothed with sparse erect, posteriorly with sparse decumbent, pale pubescence; tergites 3–5 with a thin apical fringe of sub-erect golden pubescence: sixth black apically, merging to fuscous laterally, with an apical fringe of black pubescence; seventh with a median, elongate, glabrous, tumescent area, widened and ill-defined posteriorly, the rest of the segment with small, dense punctures, sparsely clothed with erect, pale, and sub-erect, black pubescence, the segment transversely depressed sub-apically, the margin turned up. First sternite with a moderately high, prominent carina on the anterior two-thirds, clothed with sparse, erect, pale pubescence; second sternite somewhat swollen medially near the base, with large, sparse punctures except a wide median sub-apical area impunctate, polished and shining, sparsely clothed with scattered, erect, pale hairs and a thin apical fringe of pale golden pubescence; sternites 3–6 with an apical fascia of small, distinct punctures, and of scattered, pale, erect hairs sub-apically, the apex with a thin fringe of pale pubescence; seventh sternite black, ferruginous at the base, with a transverse apical fascia of distinct punctures and with a pair of low, elongate, extreme lateral tubercles, slightly convergent posteriorly and polished and shining, with a few pale hairs arising from the punctures apically; hypopygium with a pair of elevated, broad, elongate, glabrous ridges on the basal two-thirds, their inner margins slightly divergent, the outer margins convergent, their apices rounded, clothed with small close punctures laterally and between the ridges, deeply foveate between the ridges posteriorly, with moderately dense, erect, fulvous pubescence in the fovea, sparser laterally, merging to dark fuscous extreme laterally, the apex of the sclerite sinuate, feebly arched medially, the margin membranous.

Wings fuscous and iridescent; basally, nearly as far as cell M_4 in the fore wings and the apex of cell M in the hind wings, nearly hyaline; cell *2nd* $R_1 + R_2$ apically truncate, about the same length as cell R + *1st* R_1; cell R_5 receiving vein M_{3+4} just beyond the middle: cell R_4 less distinct and receiving vein M_2 at two-thirds from the base.

Legs black, clothed with moderately dense, decumbent, and sparse, erect, pale pubescence; tarsal segments with fulvous hairs apically beneath, calcaria pale; posterior coxæ concave beneath, the concavity bounded by a carina except anteriorly, the posterior angle tuberculate, the concavity filled with fine, dense pile and surrounded with sparse, erect, longer, pale golden hairs.

Female.—Head, except the antennal tubercles and basal two-thirds of the mandibles, legs except the coxæ, and abdomen except the first sternite, black; the mandibles, except their tips, antennal tubercles, whole thorax, coxæ and first sternite, ferruginous; second tergite with a pair of ill-defined, anterior lateral spots of sparse, pale golden pubescence; third and fourth together with broad apical fasciæ of moderately dense, pale golden pubescence, not at all interrupted medially; pygidial area with a few longitudinal rugulosities at the base laterally, the rest with fine transverse rugulosities concentrically arched from the apex, the extreme apex glabrous. Length 5.5 mm.

Head black except the clypeus, antennal tubercles and the basal two-thirds of the mandibles ferruginous; clypeus elevated medially, the elevation carinate between the antennæ, strongly widened with the surface flattened, distally, its lateral margin continued laterally as an arcuate, subapical ridge, the surface depressed before the margin; the median area armed with a distinct, glabrous tubercle near the margin, and which just overhangs the margin medially; surface of median elevation finely rugulose with scattered, long, pale pubescence, strongly receding laterally; scape clothed with sparse, pale pubescence and with a few scattered, moderate punctures; pedicel one-third the length of the first flagellar segment, the first about one and one-half times the length of the second (all measured dorsally); antennal scrobes carinate above; antennal tubercles rugulose; frons with moderate, distinct punctures above the antennæ medially and extending a little upwards and laterally, the rest of the frons and the vertex with moderately large, confluent punctures in irregular rows; genæ with smaller, distinct punctures; gular area nearly glabrous, with fine remote punctures; frons with very sparse, appressed, pale golden pubescence, slightly coppery medially, with short, sub-erect, piceous hairs on the frons above and on the vertex, with a thin fringe of pale pubescence round the posterior margin of the head; genæ with sparse, appressed, pale pubescence and scattered, erect, pale hairs; margins of postgenæ bounding the mouth cavity with a small tooth two-fifths of the distance from the base of the mandibles to the mid-line; relative widths of head and thorax 6.3:5.9.

Thorax ferruginous; lateral margins of dorsum subparallel, slightly narrowed in the mesothoracic region, widest posteriorly at the brow; dorsum with moderate, shallow, confluent punctures, each with an erect, or suberect and retro-curved hair, the pubescence piceous except in the pronotal area pale; humeral angles rounded, sides of pronotal area with a few shallow punctures anteriorly; scutellar scale distinct, rather low, three times as wide as high; brow of propodeon rounded, the posterior face not abruptly sloped, longitudinally rugose, the rugosities divergent from apex to base, the lateral angles moderately denticulate; posterior face of propodeon sparsely clothed with erect, pale pubescence; pleura and sides of propodeon sub-nitent micropubescent, the pubescence more distinct ventrally; sides of propodeon rugulose dorsally; mesepisternal area above the intermediate coxæ with a small anterior tubercle.

Abdomen black except the first sternite ferruginous and the apex of the pygidial area piceous; first tergite clothed with sparse, long, erect, pale pubescence, and with short sub-erect, black pubescence dorsally; anterior face of first tergite flat, with a few shallow, foveolate punctures, dorsal surface with fine, shallow punctures, apex glabrous; second tergite with shallow, elongate, moderately close punctures on the basal two-thirds, with very fine, close punctures posteriorly, clothed with long, sub-erect, pale pubescence anteriorly, short appressed, black pubescence posteriorly, with a few; erect, piceous hairs and with a pair of indistinct, sub-circular, antero-lateral spots of sparse, appressed, pale, glittering pubescence; third and fourth tergites closely and finely punctate, with a broad fascia of dense, appressed, pale golden, glittering pubescence and a few erect pale hairs, the third with a subapical fringe of short, piceous pubescence; fifth tergite finely punctate, with appressed black pubescence and erect, pale hairs; sixth tergite with minute, shallow punctures basally and laterally, sparse, erect, pale hairs and appressed black pubescence; pygidial area somewhat short and wide, with a few, fine, longitudinal rugulosities at the base, the last entirely, finely transversely rugulose, the rugulosities concentrically arched from the apex, their ridges microscopically interrupted, giving them a beaded appearance, laterally carinate on the posterior half, the extreme apex glabrous and ferruginous; first sternite with a median longitudinal carina on the anterior third, with scattered, erect, pale pubescence laterally; second sternite with moderately large distinct punctures, smaller and closer punctures at the posterior margin, with scattered, erect and sparse, decumbent pale pubescence and with an apical fringe of pale hairs; sternites 3–5 with fine dense punctures posteriorly, a few scattered erect pale hairs and an apical fringe of pale pubescence; hypopygium with small, dense punctures and sparse, erect, pale pubescence.

Legs black, the coxæ ferruginous; anterior coxæ infuscate externally and arched with a distinct glabrous tubercle beneath; extreme base of anterior and intermediate femora beneath tinged with ferruginous; intermediate and posterior femora polished and shining post-dorsally, otherwise the legs clothed with scattered, erect, and sparse, appressed, pale pubescence: calcaria pale; spines on intermediate and posterior tibiæ ochreous.

Holotype.—Male, Simpang Lima, Alor Pongsu, Krian, Perak, Federated Malay States, 20 May 1930; *in copula* with female. Genitalia mounted on a slide. In British Museum of Natural History, London.

Allotype.—Female, Simpang Lima, Alor Pongsu, Krian, Perak, Federated Malay States, 20 May, 1930; *in copula* with male. In British Museum of Natural History, London.

Paratype.—Krian, Perak, Federated Malay States: male and female *in copula*, Simpang Lima, Alor Pongsu, 29 April 1930; male and female *in copula* Simpang Lima, Alor Pongsu, 20 June 1930; male, Siakap Road, Kuala Kurau, 5 September 1930; 2 males and male and female *in copula*, Siakap Road, Kuala Kurau, 28 September 1930; female, Kampong Jalan Baharu, 2nd mile up irrigation canal, 4 March 1930; female, Parit Buntar, 21 August 1930; female, Siakap Road, Kuala Kurau, 20 September 1930; female, 5th mile Siakap Road, Kuala Kurau, 9 October 1930; 2 females, Parit Buntar, 29 December 1930; female, Parit Buntar, 2 June 1931; female, Bagan Serai, 31 January 1932. Kedah, (Unfederated Malay States): female, Alor Star, 29 March 1931.

A paratype of each sex in Selangor Museum, Kuala Lumpur, Federated Malay States, on loan, and in the collection of the University of Minnesota, St. Paul, U.S.A.

One paratype female 28.9.1930 has the abdomen, particularly the pygidial area with dark ferruginous suffusions.

Timulla (Trogaspidia) krianæ sp. n. (Figs. 7–11).

Male.—Head, thorax, legs, apical half of sixth and whole of seventh tergite, apical half of sixth and whole of seventh and eight sternite, black; abdominal segments 1–5 and base of 6, ferruginous; median area of clypeus sub-triangular, slightly concave in profile, demarcated anteriorly by a submarginal, transverse, curved, raised line, the margin receding, its surface concave, slightly emarginate; scutellum elevated and with a median, longitudinal, glabrous line, raised posteriorly, furrowed anteriorly, on the anterior face of the elevation; seventh tergite with a strong, median, longitudinal carina depressed and widened at the base, terminating before the margin, emarginate apically, the lateral angles rounded; hypopygium with a pair of lateral, glabrous ridges on the anterior half, the ridges not convergent, the apex of the segment produced, moderately rounded. Length 14.6 mm.

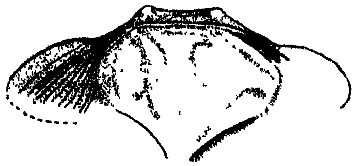

Fig. 7. *Trogaspidia krianæ* sp. n. Clypeus of ♂. (No. 1941).

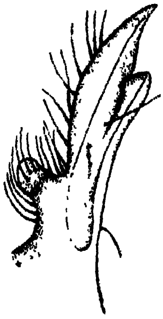

Fig. 8. *Trogaspidia krianæ* sp. n. Left mandible of ♂. (No. 1941).

Head entirely black, except the mandibles tinged with very dark ferruginous, almost piceous, subapically; mandibles simple at the apex, the tooth slightly sinuate on its inner margin, with a strong subapical tooth on the inner margin, deeply emarginate beneath with a strong, blunt tooth at the base of the emargination; clypeus clothed with pale pubescence laterally and with a thin, lateral, marginal fringe of pale hairs; median area of clypeus not well defined, sub-triangular, widely arched anteriorly, slightly swollen in the middle distally and receding laterally, slightly concave in profile, polished and shining except the base with fine piliferous punctures, the pubescence pale, curved downwards and overhanging the surface, lateral areas strongly, obliquely striate; median area of clypeus demarcated anteriorly by a transverse, curved, raised line, margin of clypeus receding, concave, the lateral angles slightly swollen, glabrous, the concavity with scattered piliferous punctures, the hairs moderately long, pale golden; scape bicarinate beneath, with a few fine piliferous punctures between the carinæ and larger punctures dorsally, clothed with fine, pale, appressed pubescence with a few long, scattered, pale hairs anteriorly; pedicel annular, about three-sevenths the length of the first flagellar segment the first slightly longer than the second; antennal scrobes not carinate above; frons with moderately coarse, contiguous punctures, almost reticulate, the punctures very small in the emargination of the eyes, largest on the vertex laterally, smaller and somewhat confluent occipitally but with some distinct, transverse-oblique ridges between them laterally towards the genæ; genæ with moderately small, very close punctures, arranged in irregular dorso-ventral lines, the surface between the lines of punctures moderately shining, the punctures sparse round the posterior margin of the eye; frons clothed with appressed, pale golden pubescence, denser medially between the antennal tubercles, intermixed with scattered, erect, pale hairs, the hairs fuscous dorsally below the ocelli, with a few widely spaced, erect fuscous hairs within and above the emargination of the eyes; vertex with scattered, erect, pale hairs and a few shorter, sub-erect, black hairs; genæ and ventral surface of head with sparse, erect, pale pubescence, the genæ along the posterior margin of the eyes, and the malar space, with appressed pale pubescence, a few erect, dark fuscous hairs along the eye margin dorsally; ocellar area moderately elevated, medially longitudinally depressed, rugosely punctate; ocelli moderately small, distance of lateral ocelli from the eyes about equal to one and two-thirds times their distance from each other and about two and one-twelfth times the diameter of the anterior ocellus; relative widths of head and thorax including the tegulæ 13:16.

Thorax entirely black; pronotum anteriorly with distinct, fine punctures on the brow, coarsely, reticulately punctate above, more finely medially, the lateral concavities longitudinally rugose; pronotum clothed with appressed, pale golden and scattered, erect, pale hairs, the lateral concavities with the surface micropubescent; mesonotum coarsely, reticulately punctate, the sculpture tending to longitudinal lines, the anterior, median, glabrous line distinct to well past the middle, the puncturation finer antero-medially and with an extreme anterior, median, transverse area, micropunctate; parapsidal furrows distinct on the posterior half, deep and widened posteriorly; mesonotum clothed anteriorly with erect, the rest with sub-erect, black pubescence, with a small patch of short, fine, pale hairs antero-laterally; scutellum elevated, reticulately punctate, with a somewhat irregular glabrous line, depressed anteriorly, slightly raised posteriorly, on the anterior face, divided from the mesonotum by a deep, transverse, glabrous sulcation; dorsum of propodeon twice as wide as long, defined laterally by a distinct, raised, glabrous line, the surface reticulate, with a distinct, elongate median area, widened basally, twice as long as its basal width, terminating in a low tubercle on the brow, and with a large, sub-ovate area at the base on either side of the median area, the whole dorsum clothed with dense, appressed, pale pubescence; posterior face of propodeon divergently reticulate from the apex, the reticulations elongate apically, divided longitudinally by a sinuate median carina, micropubescent and with sparse, erect, pale hairs; propectus micropunctate and micropubescent, with some moderate, shallow punctures anteriorly beneath; mesepimeron micropunctate and micropubescent in the anterior concavity, with a few clear distinct punctures on the anterior slope, the convexity reticulately punctate, clothed with a short, dense, silvery-white pile and long, erect, pale pubescence; pleural suture deep and foveolate; mesepisternum reticulately punctate, with a few shallow punctures on the posterior slope, micropunctate and micropubescent postero-ventrally; clothed with a short, silvery-white pile and long, erect, pale pubescence; meta-epimeron micropunctate and micropubescent, longitudinally rugose where it joins the propodeon; meta-episternum micropunctate and micropubescent, with scattered shallow punctures postero-ventrally; sides of propodeon reticulate above, finely longitudinally rugose anteriorly, micropunctate and micropubescent below; tegulæ large, glabrous except the anterior and inner margins with piliferous punctures, the hairs black.

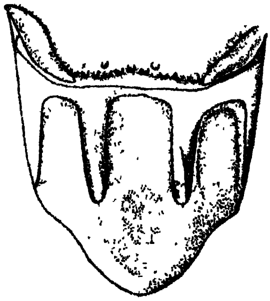

Fig. 9. *Trogaspidia krianæ* sp. n. Seventh and eighth sternites and carinæ of ♂. (No. 1941).

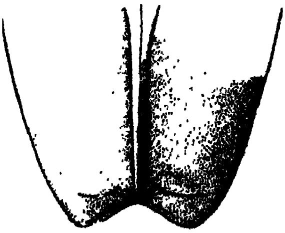

Fig. 10. *Trogaspidia krianæ* sp. n. Last tergite of ♂.

Abdomen ferruginous except the apex of the sixth and the following segments, black, the carina on the first sternite piceous marginally; first tergite piceous at the extreme base laterally, with small, moderately close punctures laterally, very fine, scattered punctures apically, the disc with moderately large, obtuse punctures, clothed with erect, pale pubescence and a thin apical fringe, interrupted medially, of pale pubescence; second tergite somewhat transversely elevated medially, gibbous, clothed with moderately dense piliferous punctures laterally and basally, the puncturation interrupted medially at the base, the disc almost impunctate, with a few, fine, scattered punctures posteriorly, clothed with sparse, erect, pale pubescence basally, scattered ferruginous pubescence posteriorly, with a thin, medially interrupted fringe of reddish-golden pubescence apically; tergites 3–6 with dense, fine punctures laterally, the punctures finer and more remote dorsally, interrupted by a median, longitudinal, glabrous area, 3–5 clothed with sparse, erect, pale pubescence, 4 and 5 with appressed, pale golden pubescence on the apical half on either side of the median glabrous area, each with a thin apical fringe of reddish-golden pubescence interrupted medially, the sixth with a few erect, scattered pale hairs basally and laterally, the rest with moderately dense black pubescence; seventh tergite with very fine sparse punctures at the extreme base (normally not exposed), the rest with fine, dense puncturation and a strong, median glabrous carina, widened and depressed at the base, laterally compressed and elevated on its posterior third, almost reaching the margin, emarginate apically, the lateral angles rounded, the surface depressed to the margin, concave towards the lateral margins which are elevated, clothed with black pubescence basally, the apical half with pale golden pubescence; first sternite with a prominent, median, longitudinal carina on the anterior four-sevenths, the ridge of the carina piceous, laterally rugulose and clothed with scattered, erect, pale pubescence and short, scattered, silvery pile; second sternite in profile with the posterior four-fifths straight, anteriorly steeply sloped to the base, the anterior sulcation not defined by a lateral, oblique carina, medially swollen on the brow at the base, the swelling slightly laterally compressed, with large, rather dense punctures, impunctate medio-posteriorly, the posterior lateral angles with small close punctures and the margin with a line of very fine punctures, clothed anteriorly with erect, posteriorly with sub-erect, pale pubescence, with a thin marginal fringe (widely interrupted medially) of pale pubescence; sternites 3–5 with a broad apical band of small, close punctures, very dense laterally, interrupted antero-medially, each with a thin, medially interrupted fringe of pale pubescence and with a few, scattered, erect, pale hairs on the punctate portion: sixth sternite with a pair of low, slightly elongate, posteriorly divergent, glabrous tubercles near the margin laterally, the puncturation similar to the preceding sternites, clothed with scattered, erect, pale and more dense, short, sub-erect pubescence, with a feeble marginal fringe of pale pubescence interrupted medially; seventh sternite with a pair of extreme lateral, glabrous ridges, strongly convergent on the posterior margin, with fine, close, slightly confluent punctures between the ridges and very fine punctures in the lateral areas, clothed with stiff, sub-erect, black pubescence and a few, scattered, erect, pale hairs; hypopygium with a pair of elevated, lateral, glabrous ridges on the anterior half, the ridges slightly divergent at the base inwardly, the margin of the sclerite medially produced and rounded, laterally sinuate, membranous, the surface medially foveate posterior to the ridges, with fine, close, piliferous punctures, the fovea nearly impunctate, clothed with scattered, erect, pale hairs and shorter, stiff, sub-erect, black pubescence, with moderately dense, golden fuscous pubescence sub-apically.

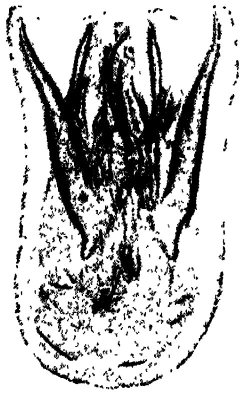

Fig. 11. *Trogaspidia krianæ* sp. n. Genitalia, ♂. (No. 1939).

Wings fuscous and iridescent in the apical two-thirds, basal third pale luteous; cell *2nd* $R_1 + R_2$ truncate at the apex, a shade longer than cell R + *1st* R_1; cell R_5 receiving vein M_{3+4} at two-thirds from the base; cell R_4 less distinct, receiving vein M_2 at considerably more than two-thirds, about four-fifths from the base.

Legs black, clothed with moderately dense, appressed and sparse, erect, pale pubescence; calcaria pale; setæ at apex of tibiæ and of tarsal segments beneath, aureo-fulvous; posterior coxæ strongly carinate on the inner margin posteriorly.

Holotype.—Male, Selinsing, Perak, Federated Malay States, June 24th, 1930; taken at the side of the footpath along the Gula Fresh Water Canal near Selinsing, taken in the morning at dew on the leaves of *Colocasia* sp. Genitalia mounted on a slide. In British Museum of Natural History, London.

Paratype.—Three males taken with the above, Selinsing, Perak, Federated Malay States, June 24th, 1930 (all H.T.P.).

One paratype in Selangor Museum, Kuala Lumpur, Federated Malay States, on loan: one deposited in the collection of the University of Minnesota, St. Paul, U.S.A.

*Variety**.—Corresponds with the above description in all respects except the pubescence of the sixth and seventh tergites and of the sixth to eighth sternites entirely deep glittering golden.

Selinsing, Perak, Federated Malay States, June 24th, 1930 (H.T.P.).

Smicromyrme kellyi sp. n. (Figs. 12–14).

Male.—Head, thorax, legs, first abdominal segment and last two abdominal segments, black; abdomen ferruginous; wings fuscous; mandibles tridentate, deeply emarginate and with a tooth near the base posteriorly; clypeus clothed with appressed, pale pubescence; median area of clypeus roughly pentagonal in outline, the surface concave and with a pair of lunate tubercles submarginally, the dorsal angle tuberculate; frons minutely tuberculate medially below the antennal tubercles; antennal scrobes carinate above; mesepisternum very strongly tuberculate anteriorly beneath and with a less elevated, transverse tubercle in front of the intermediate coxæ; seventh tergite with a depressed, median, elongate area, polished and shining; hypopygium deeply foveate posteriorly, the margin bilobed.

Head black, mandibles with a pre-apical, dark ferruginous cloud; mandibles tridentate and very broad apically, deeply excised and with a strong, blunt tooth near the base, posteriorly; clypeus clothed with sparse, pale, appressed pubescence, the median area concave and defined anteriorly by a transverse, sinuate ridge, subtuberculate on the ridge at about the lateral third, the margin receding and feebly arched; base of median area below the antennæ, porrect

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* The term variety as here used indicates an aberration and in no sense refers to a subspecies; for this reason no name is given to this variation.

and tuberculate: scape distinctly bicarinate on the distal half beneath, with fine, scattered punctures and clothed with sparse, pale pubescence; pedicel piceous, twice as wide as long; first flagellar segment dark fuscous at the base, as wide as long and twice as long as the pedicel; second flagellar segment twice as long as the first; (ratio of pedicel and first two flagellar segments 1:2:4): antennal scrobes carinate above, the carina continued along the outer margin of the antennal tubercles; frons minutely tuberculate medially below the antennal tubercles and above the tuberculation of the median area of the clypeus; frons shallowly, confluently punctate, longitudinally channelled towards the vertex, densely clothed with appressed, pale pubescence, interspersed with scattered, erect, pale hairs, the pubescence sparse laterally and encroaching between the ocelli; vertex more distinctly punctate, with a large, glabrous, polished space postlateral to the ocelli; ocellar area slightly elevated; ocelli moderately large, the lateral ocelli about as far from the eyes as from each other, the diameter of the anterior ocellus five-sixths of this distance: genæ closely, shallowly, confluently punctate; gula nearly impunctate, the posterior margin of the head beneath transversely rugulose; vertex and genæ with scattered, erect, and sparse, appressed, pale pubescence; head beneath with long, erect, pale pubescence. Relative widths of head and thorax including the tegulæ 10:13.5.

Thorax black; pronotum shallowly confluently punctate, the sculpture entirely obscured dorsally by dense, appressed, pale golden pubescence; lateral lobes of pronotum obliquely, longitudinally rugose and micropunctate, clothed with sparse, pale pubescence; mesonotum coarsely and densely confluently punctate, clothed with sparse, sub-erect, black pubescence; parapsidal furrows extending the whole length of the mesonotum; scutellum simple, coarsely and deeply confluently punctate, clothed anteriorly with sparse, erect and sub-erect black pubescence, dorsally and posteriorly with dense, appressed, pale golden pubescence and scattered, erect, pale hairs; sulcus between mesonotum and scutellum very deep and wide, polished and shining; metanotum medially with dense, appressed, and scattered, erect, pale golden pubescence; dorsum of propodeon reticulate, with an elongate median space, densely clothed with appressed, pale golden pubescence; brow of propodeon rounded; posterior face of propodeon reticulate, divided longitudinally by an irregular, median carina, clothed with long, erect, pale pubescence and with sparse, appressed, pale pubescence laterally: propectus microshagreened laterally, finely punctate anteriorly and posteriorly beneath, the rest of the ventral surface micropunctate and micropubescent, clothed with scattered, erect, pale pubescence; mesepimeron micropunctate, micropubescent and shining in the anterior concavity, with a few shallow punctures on the slope, the convexity moderately but shallowly, confluently punctate, clothed with dense, appressed and sparse, sub-erect, pale golden pubescence; mesopleural suture foveolate; mesepisternum with similar sculpture and pubescence, the puncturation tending to shallow reticulation discally, the ventral surface on either side of the mesosternum very strongly tuberculate on the brow anteriorly, less strongly on the posterior brow where the tubercle is continued as a carina to the mid-line; meta-epimeron shining, micropunctate and micropubescent; meta-episternum with large, shallow punctures postero-ventrally; sides of propodeon extensively, shallowly reticulate above, narrowly shining, micropunctate and micropubescent below.

Abdomen ferruginous, first tergite black except apically, last tergite and first, seventh and eighth sternites, black: first tergite with moderately large, shallow, confluent punctures basally and medially, with fine, close punctures laterally and apically, clothed with long, erect, pale pubescence and with a thin apical fringe of fulvous pubescence; second tergite with small, close punctures, very fine subapically, clothed antero-laterally with long, erect, pale pubescence, the pubescence shorter and more golden posteriorly, the posterior half with short, scattered, decumbent ferruginous hairs, a few erect sub-apically, and with a thin apical fringe of long, ferruginous pubescence; tergites 3 to 6 finely and fairly evenly punctate, clothed with sparse erect and sparse decumbent pubescence, that on 3 distinctly ferruginous, on 4, 5 and 6 golden-ferruginous, 3 to 5 with a thin apical fringe of ferruginous pubescence, the fringe on 6 black; seventh tergite densely and finely foveolately punctate, clothed with moderately dense black pubescence and with a black apical fringe, with a long, narrow, glabrous, median area: first sternite black, with a strongly elevated median carina on the anterior two-thirds, with a few foveolate punctures and scattered, erect, pale pubescence, laterally; second sternite with moderate, evenly spaced punctures, very fine, dense punctures apically, clothed with scattered, erect, pale pubescence and with a thin apical fringe of pale golden pubescence: sternites 3 to 6 with fine, uneven punctures, scattered, erect, pale pubescence and a thin apical fringe of pale golden pubescence; seventh sternite with a few minute punctures, the posterior margin strongly depressed and widely emarginate, with a few, minute, pale hairs; hypopygium with a deep, longitudinal, median fovea extending to the posterior margin, the lateral convexities with a few piliferous punctures, stout, erect, curved, black hairs and finer, sparse, black pubescence, the posterior margin luteous, membranous and bilobed.

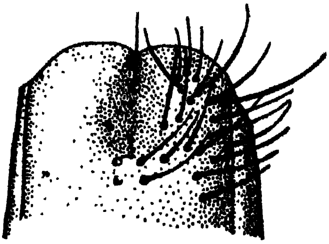

Fig. 12. *Smicromyrme kellyi* sp. n. ♂. Eighth sternite.

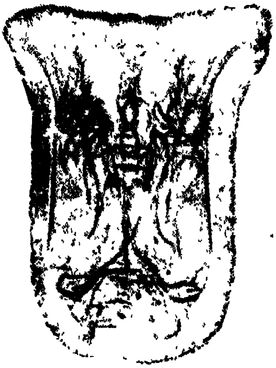

Fig. 13. *Smicromyrme kellyi* sp. n. Genitalia, with genital tube extruded.

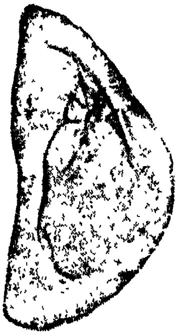

Fig. 14. *Smicromyrme kellyi* sp. n. External view of right squama.

Legs black, clothed with sparse, pale pubescence; calcaria pale; posterior coxæ carinate on the inner margin.

Wings fuscous; cell *2nd* $R_1 + R_2$ the same length as cell R + *1st* R_1; cell R_5 receiving vein M_{3+4} in the middle: cell R_4 less distinct, receiving M_2 at more than two-thirds from the base: vein R_5 with a short branch into cell R_4 near the middle: cell R + *1st* R_1 with a pale, transverse streak medially; cell R_5 and R_4 with a pale, longitudinal streak posteriorly; cell *1st* M_2 with a pale spot in the distal angle.

Female.—Head, legs and abdomen, black; thorax ferruginous, with a scutellar scale: basal half of mandibles, antennal tubercles and apex of scape, ferruginous; clypeus elevated and sub-carinate medially, widely arched laterally, armed with a pre-apical, glabrous tooth medially; first tergite with an apical fringe, second with a large, anterior, median spot and a medially widened apical fascia, third with a broad entire fascia, fourth and fifth with an extreme lateral patch of golden pubescence; pygidial fringes golden basally; pygidial area sub-ovate, strongly carinate laterally, irregularly divergently striate, the extreme apex sub-rugulose; sternites with thin apical fringes of silvery pubescence. Length 7.7 m.m.

Head black except the basal half of the mandibles, antennal tubercles and apex of scape, ferruginous, the scape piceous; mandibles simple; clypeus rugulose, strongly elevated and sub-carinate medially, with a distinct, pre-apical, glabrous tooth, clothed with sparse, pale pubescence; antennal tubercles rugulose; scape with scattered, foveolate punctures and sparse, pale pubescence; pedicel as wide as long, narrowed basally; first flagellar segment about twice as long as the pedicel and about one and one-half times as long as the second; antennal scrobes not carinate above; vertex and frons coarsely, reticulately punctate, occiput shallowly, foveolately punctate, genæ with shallow, foveolate punctures, malar space and postgenæ area with fine punctures, gula rugulose; antennal tubercles and frons above the antennæ clothed with sparse, pale pubescence, a few appressed, auburn hairs on the frons medially, rest of frons and the vertex with appressed and scattered, erect, black pubescence; occipital area with fine, appressed, and scattered, erect, pale pubescence; genæ and malar space with sparse, appressed, pale pubescence; head beneath and posteriorly with scattered, erect, pale pubescence. Head and thorax the same width.

Thorax ferruginous; dorsum widest across the pronotal angles, narrowest in the pro-mesonotal area: with a scutellar scale; dorsum coarsely reticulately punctate, strongly denticulate in the scutellar area and on the brow of the propodeon; posterior face of propodeon coarsely reticulately punctate dorsally, denticulate in the lateral areas, finely foveolately punctate and rugulose apically; dorsum with scattered, erect, and sparse, appressed, black pubescence, with a few appressed, golden hairs throughout, particularly in the pronotal area laterally, some of the long hairs laterally, pale; posterior face of propodeon with long and sparse, erect, pale pubescence; pleural areas shining, microscopically sub-punctate, with sparse, appressed, silvery pubescence, rather dense above the intermediate and posterior legs.

Abdomen black; first tergite finely, foveolately punctate, minutely punctate medially, sparsely clothed with long, erect, pale pubescence and with an apical fringe of pale golden pubescence; second tergite with fine, dense, confluent, foveolate punctures, larger and less dense laterally, and minute, distinct punctures apically, clothed with moderately dense appressed, and scattered, erect, black pubescence and with an anterior median spot and a posterior apical fascia, widened medially, of appressed golden pubescence, the sclerite laterally with scattered, pale hairs, the lateral pubescent line fulvous; third tergite finely punctate. with a broad, entire, apical fascia of appressed, golden pubescence and with scattered, erect, pale pubescence; tergites 4 and 5 finely punctate, clothed with moderately dense, appressed, and scattered, erect, black pubescence and with an extreme lateral patch of pale golden pubescence; sixth tergite densely punctate at the base laterally, smooth postero-laterally, clothed with scattered, erect, pale pubescence, the pygidial fringes golden basally, distally piceous; pygidial area sub-ovate, strongly carinate laterally, irregularly divergently striate, the extreme apex subrugulose: first sternite ferruginous, with an elevated, median carina on the basal two-thirds, laterally with a few, small, foveolate punctures, clothed with scattered, pale pubescence; second sternite with moderate, fairly even punctures, finely punctate marginally, with scattered, pale pubescence and a thin apical fringe of pale pubescence; sternites 3 to 5 finely and densely punctate, with scattered, pale pubescence and a thin apical fringe of pale pubescence; hypopygium with small, close punctures and scattered, erect, pale pubescence.

Legs black; intermediate and posterior coxæ ferruginous, the anterior coxæ slightly so at the base; tarsi piceous; claws ferruginous; clothed with sparse, pale pubescence; tarsal pecten dark ferruginous; tibial spines piceous; calcaria pale.

Holotype.—Male, Bukit Panchor, Kedah, (Unfederated Malay States), 10 July, 1929; genitalia on a slide. In British Museum of Natural History, London.

Allotype.—Female, Bukit Panchor, Kedah, (Unfederated Malay States), 10 July, 1929. In British Museum of Natural History, London.

Paratypes.—Bukit Panchor, Kedah, Unfederated Malay States: 1 male and 1 female, 8 July 1929; 4 males and 24 females, 10 July 1929; 9 females (5 by R. P. Kelly) 3 September 1929; 1 female, 21 February 1930; 3 females (1 by R. P. Kelly) 27 March 1930; 3 males and 2 females, 29 August 1930; 3 females, 3 September 1930. Selangor, Federated Malay States: 1 female, Serdang, 9 May 1928: 1 female, Serdang, 23 May 1928; 1 female, Ulu Langat, 19 August 1928: 1 female Serdang, 10 September 1928: 1 male, Kuala Lumpur, 25 January 1930.

Variety:

Male.—Identical in all respects structurally but has the black pubescence entirely replaced by golden; mesonotum, tegulæ, scutellum anteriorly, last tergite and hypopygium clothed with golden pubescence, the other pubescence normal.

Female.—Has the same peculiarity as the male and the pygidial area is dark ferruginous, not black; pubescence of frons, vertex and dorsum of thorax, golden; the appressed and erect pubescence of the second, fourth and fifth tergites and the apical half of the pygidial fringes, deep golden, the other pubescence normal.

Male.—One specimen, Bukit Panchor, Kedah, (Unfederated Malay States),.10 July 1929.

Female.—One specimen, Bukit Panchor, Kedah, (Unfederated Malay States), 10 July 1929.

A pair of paratypes have been deposited in the Selangor Museum, Kuala Lumpur, Federated Malay States and another pair in the collection of the University of Minnesota.

Squamulotilla arundinacea sp. n. (Figs. 15, 16).

Female.—Head black, except the mandibles, clypeus, scape and first flagellar segment, and the mouth cavity and gula, ferruginous; thorax ferruginous; abdomen black except the base of the first tergite and an apical median spot dorsally, the posterior margin of the second and third tergites and the whole of the first sternite, ferruginous: vertex medially longitudinally carinate, with a sub-rectangular, transverse patch of dense, appressed, golden pubescence; genæ swollen and armed with a strong spinose tubercle; mandibles piceous apically, armed with a strong, obtuse tooth on the inner margin near the base; dorsum of thorax laterally spinose; meso-episternal area produced anteriorly into a strong, curved lamella; first tergite with a large, apical, transverse, median spot of golden pubescence: second tergite with a basal macula and a broad apical fascia, widened medially, of golden pubescence; third with an entire fascia, fourth with a broad transverse spot and fifth with a small median wedge, of golden pubescence; pygidial area lanceolate, narrow at the base and widened posteriorly, partially obscured by a lateral fringe of pale golden hairs; first sternite not elevated in a carina medially; sternites 2–5 each with a thin apical fringe of pale golden pubescence; legs ochreous, the apices of the femora fuscous. Length 6.5 mm.

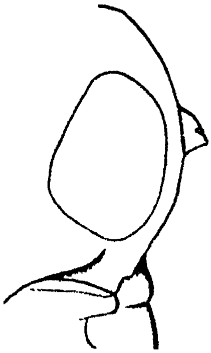

Fig. 15. *Squamulotilla arundinacea* sp. n. Oblique dorso-lateral view of left eye, base of mandible and cheek showing tubercles. (No. 2543).

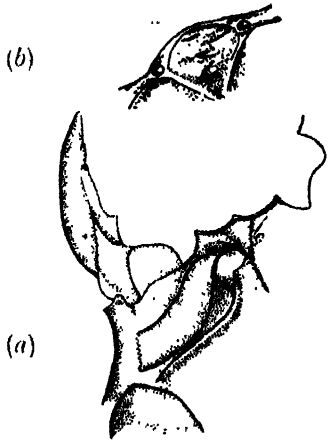

Fig. 16. *Squamulotilla arundinacea* sp. n.
(*a*) Front view of left mandible, clypeus and base of left antenna. (No. 2543).
(*b*) Ventral view of clypeus.

Head black; frons polished and shining, with small, shallow, foveolate punctures, finer and closer above the scrobes laterally, larger and confluent dorsally, clothed with sparse silvery pubescence above the scrobes, the rest with short, sub-erect, fuscous pubescence and scattered erect black hairs; vertex medially longitudinally subcarinate, finely rugulose and clothed with a transverse, sub-rectangular patch of appressed golden pubescence; vertex laterally, and the genæ, closely confluently punctate, the genæ strongly swollen dorsally and with a strong tubercle behind the eye postero-laterally; postgenal area with the punctures small and very shallow; gula almost impunctate laterally and towards the mentum, swollen and rugulose posteriorly; genæ and malar space clothed with sparse, decumbent, pale pubescence, the head beneath with scattered, erect, pale pubescence; mandibles ferruginous, their distal half extensively piceous, armed with a strong, obtuse, tooth on their inner margin near the base and with two, feeble, subapical teeth, the apex simple; clypeus swollen medially, tridentate, the median tooth little more than a tubercle at the apex of the median swelling; antennal scrobes carinate above; scape ferruginous, shallowly punctate and with sparse, pale pubescence; pedicel ferruginous, wider than long; first flagellar segment black, two and three-quarter times the length of the pedicel and one and seven-tenths times the length of the second. Relative widths of head, across the eyes, and thorax, across the mesothoracic tubercles, 8:8; if the head is measured across the genal tubercles the relative widths are 8.8:8.

Thorax ferruginous, the dorsum sub-rectangular, rather shallowly confluently punctate, clothed with sparse erect fuscous pubescence, pale anteriorly, and sparse decumbent pale golden pubescence; anterior margin of pronotum with a denticle situated at one-seventh from the lateral angle; lateral margins of dorsum dentate, the pronotum widened posterior to the lateral angle in a blunt tooth, narrowed posteriorly; mesonotal area with the sides sub-parallel anteriorly, slightly swollen in the anterior quarter, strongly tuberculate posterior to the middle and narrowed to the propodeon; sides of the propodeon arched and denticulate; lateral margins of dorsum with long pale hairs projecting laterally from the tubercles; brow of propodeon with a few small denticles; posterior face of propodeon longitudinally rugose, clothed with sparse, erect, pale pubescence; pleural areas mealy, sub-nitent, micropunctate and micropubescent, the mesepisternal area with a strongly developed curved, lamellate process above the intermediate coxæ anteriorly; sides of propodeon distinctly but finely punctate.

Abdomen black; basal half of anterior face of first tergite ferruginous; first tergite finely, remotely punctate, the anterior face clothed with scattered pale erect hairs, the dorsal face with appressed black pubescence and scattered pale hairs, and with a median, transverse macula of appressed golden pubescence on the posterior margin, the surface ferruginous beneath the macula; second tergite with fine, dense, foveolate punctures dorsally, more remotely punctate laterally, clothed with appressed black pubescence and a few scattered, erect, black hairs, some of the pubescence anteriorly and laterally, pale, with a transverse, median, semilunar macula of appressed, golden pubescence anteriorly and contiguous to that on the first tergite, and a broad fascia, strongly widened medially, of appressed golden pubescence, on the posterior margin, the margin ferruginous beneath the pubescence; lateral pubescent line rather broad; tergites 3–5 finely and closely punctate, the third with a broad apical fascia of golden pubescence, the margin ferruginous; fourth with a large, transverse, apical spot of appressed golden pubescence; fifth with a small median wedge of golden pubescence, the other pubescence on the fourth and fifth tergites, black, pale laterally; sixth tergite finely and closely punctate, with moderately dense, decumbent, pale golden pubescence, convergent on the pygidial area; pygidial area polished and shining, without sculpture, lanceolate, widest about the posterior third; first sternite ferruginous, longitudinally carinate but not elevated, medially, slightly ridged laterally, with a few small shallow punctures and sparse pale pubescence; second sternite somewhat depressed baso-laterally, swollen laterally, the margin impressed, slightly longitudinally elevated at the extreme base medially, with small distinct punctures basally, confluently punctate discally, the margin with fine punctures and dully laterally, clothed with sparse pale pubescence, the margin with a thin fringe of pale pubescence; sternites 3–5 glabrous basally, densely and finely punctate posteriorly and laterally, clothed with sparse erect pale pubescence and with a thin apical fringe of pale pubescence; hypopygium finely and closely punctate, laterally carinate, clothed with sparse erect pale pubescence.

Legs pale ferruginous or ochraceous, all the femora infuscate distally; the anterior tibiæ and tarsi infuscate anteriorly; intermediate and posterior tibiæ infuscate apically; clothed with sparse, pale pubescence; calcaria pale; tibial spines dark ferruginous; posterior coxæ carinate on their inner margin beneath.

Holotype.—Female, Parit Buntar, Perak, Federated Malay States, 27 November 1931, on a sunny bank covered with *Imperata arundinacea* (known locally as 'Lalang"). In collection of British Museum of Natural History, London.

Paratype.—Female, Kampong Sungai Siakap, Krian, Perak, F.M.S., 27 February 1930, on a path in a padi field.

Squamulotilla perakensis sp. n. (Figs. 17–20).

Female.—Head mainly black; clypeus, basal two-thirds of mandibles and head beneath, fusco-ferruginous; scape and first flagellar segment fuscous; clypeus tridentate, the median tooth more produced, the clypeus elevated medially; genæ with a dentate carina along their posterior margin: thorax ferruginous, sub-rectangular, the dorsum laterally spinose; dorsum widest across the median mesothoracic tubercles; brow of propodeon strongly spinose and very abrupt; lamella of mesopleura not very prominent: abdomen mainly black; the first tergite basally, pygidial area, first sternite entirely and the second, fifth and sixth sternites medially, ferruginous; dorsum of first tergite piceous; second sternite medially, longitudinally compressed and elevated, sub-carinate, from the base for five-sevenths; first tergite apically and second tergite basally with a median semilunar spot, and the second tergite with a broad apical fascia, widened in the median third, of appressed golden pubescence; third to fifth tergites with a median apical macula of appressed golden pubescence; pygidial area lanceolate, the pygidial fringes pale golden. Length 5.2 mm.

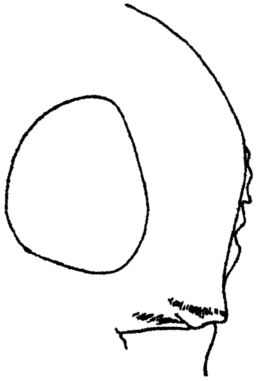

Fig. 17. *Squamulotilla perakensis* sp. n. Oblique fronto-lateral view of side of head showing base of mandible, eye and carina on gena of left side. (No. 2545).

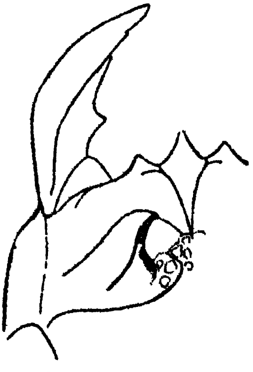

Fig. 18. *Squamulotilla perakensis* sp. n. Frontal view of left mandible, clypeus, base of left antenna, left scrobe and left supra-antennal carina. (No. 2545).

Head black; surface within the scrobes piceous; antennal tubercles, scape and first flagellar segment, dirty ferruginous; clypeus, except its tubercles, mandibles, and head beneath, ferruginous; apex of mandibles piceous: mandibles simple at apex, the inner margin with two feeble notches pre-apically and armed with a strong, obtuse tooth near the base: clypeus tridentate; median area of clypeus elevated, finely rugulose, clothed with sparse, long, pale pubescence and with a moderately dense fringe of pale pubescence along the margin: scape with scattered, minute, shallow punctures, clothed with sparse pale pubescence; pedicel slightly wider than long; first flagellar segment two and three-quarter times as long as the pedicel and one and one-third times as long as the second; antennal tubercles polished and shining; antennal scrobes carinate above: frons densely, finely confluently punctate, the punctures rather more separated medially above the antennæ where the surface is plane, not ridged: clothed with scattered, erect, piceous pubescence and sparse, appressed, pale pubescence, with a small tuft of pale pubescence between the antennal tubercles; vertex very densely, confluently punctate, the puncturation obliquely divergent from the mid-line towards the posterior margin, clothed with sparse, appressed, pale golden pubescence and scattered, erect, piceous pubescence: genæ and malar space with fine, dense, slightly confluent punctures, clothed with sparse, appressed, silvery pubescence: the genæ defined posteriorly by a fine, serrate carina: temples with short, erect, silvery pubescence, gula with a few minute punctures. Head almost exactly the same width as the thorax across the mesothoracic tubercles.

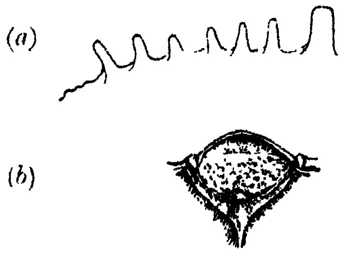

Fig. 19. *Squamulotilla perakensis* sp. n.
(*a*) Oblique dorso-frontal view of scutellar scale and right half of brow of propodeon.
(*b*) Ventral view of clypeus. (No. 2545).

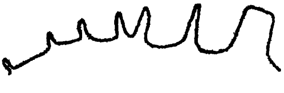

Fig. 20. *Squamulotilla perakensis* sp. n. Spines on half propodeon.

Thorax ferruginous, the dorsum sub-rectangular, seven-eighths as wide as long, densely and finely, confluently punctate, the median ridge, between the punctures, moderately distinct and uninterrupted, clothed with scattered, erect and sparse, decumbent, piceous pubescence, the pubescence pale anteriorly, the erect hairs long posteriorly; pronotum with a small tubercle anteriorly near the lateral angle; sides of dorsum dentate, widest across the mesothoracic tubercles, narrowest at the stigmatic area: brow of propodeon very abrupt and armed with a row of strong spines, the median one large, about twice as wide as the others; lateral margin of propodeon strongly denticulate: posterior face of propodeon with a fine, median, longitudinal carina, the surface with a few, feeble reticulations dorsolaterally, the rest smooth and with a few minute piliferous punctures, clothed with sparse, erect, pale pubescence: pleural areas smooth, with fine, appressed, pale pubescence; mesepisternal area with a small lamellate expansion of the anterior margin above the intermediate coxæ, sides of propodeon very finely punctate and micropubescent.

Abdomen mainly black; the base of the first tergite, the pygidial area, the whole of the first sternite and a considerable portion of the second, fifth and sixth sternites, ferruginous: first tergite with a few, fine, remote, piliferous punctures on the anterior face, the dorsal face very finely and moderately densely punctate and with a few slightly larger piliferous punctures: clothed anteriorly and laterally with scattered, erect and fine, appressed, pale pubescence, the dorsal surface with appressed black pubescence and scattered, erect, black hairs, and with a median, transverse macula of appressed, golden pubescence posteriorly: second tergite with dense, fine, foveolate punctures, very fine dorsally and posteriorly; clothed with scattered, erect and moderately dense, appressed, black pubescence, with a median anterior macula of appressed golden pubescence, contiguous to that on the first tergite, and a broad apical fascia, narrowed in the lateral thirds, of appressed golden pubescence; lateral margin with pale golden pubescence, lateral pubescent line dark golden; tergites 3–5 densely, minutely punctate, clothed with scattered, erect and sparse, appressed, black pubescence and each with a median, apical spot of appressed, golden pubescence, that on the third smallest, on the fifth largest: sixth tergite densely, finely punctate, clothed with scattered erect, pale pubescence: pygidial fringes pale, partially obscuring pygidial area; pygidial area lanceolate, ferruginous: first sternite rugulose at the base, clothed with sparse, pale pile; second sternite depressed at the base laterally, slightly swollen laterally on the disc, the margin feebly impressed, basal five-sevenths with a median, longitudinal, sub-carinate, elevation, with moderate, foveolate punctures, smaller basally and apically, scattered erect and sparse, pale pubescence and with a thin apical fringe of pale pubescence; sternites 3–5 finely and densely punctate, with scattered, erect, pale pubescence and with a thin apical fringe of pale pubescence; hypopygium with five dense punctures and sparse, erect, pale pubescence.

Legs ferruginous; femora, tibiæ and tarsi strongly infuscate; intermediate and posterior coxæ bituberculate beneath, posteriorly; calcaria pale; tibial spines dark fuscous; clothed with sparse pale pubescence.

Holotype.—Female, Parit Buntar, Perak, Federated Malay States, 22 June 1929. In British Museum of Natural History, London.

Paratype.—Female, Parit Buntar, Perak, Federated Malay States, 1 December, 1931.

The paratype differs from the holotype in the following particulars: clypeus and antennal tubercles, black; mandibles, scape and first flagellar segment darker; head beneath less extensively ferruginous; legs darker; abdomen beneath less extensively ferruginous; length 7 mm.

Squamulotilla selangorensis sp. n.

Female.—Head black, moderately finely and closely punctate; mandibles ferruginous; clypeus, antennal tubercles, scape and pedicel pale ferruginous: clypeus shallowly bi-emarginate, with a minute median submarginal spine, the lateral angles sub-spinose, the median area swollen; first flagellar segment twice as long as the second; antennal scrobes strongly carinate above; posterior margin of genæ defined by a weak, irregular carina. Thorax and legs ferruginous; dorsum of thorax densely confluently punctate, the median ridge more pronounced and extending in an almost unbroken line from the pronotal area to the median spine on the brow of the propodeon; pronotal area with a pair of distinct spinose tubercles laterally on the dorsum; lateral margin of dorsum sub-dentate, the lamellate spine in the mesonotal area much stronger than the others; brow of propodeon with a strong median spine, denticulate laterally; lateral margin of propodeon strongly spinose; posterior face of propodeon finely and closely punctate dorsally, more remotely towards the apex; squama of mesopleuron well developed and twisted; sides of propodeon finely, remotely punctate. Abdomen black; the first tergite basally and laterally extensively ferruginous, with a median, apical, transverse spot of pale golden pubescence; second tergite with a pale golden apical fascia widened medially; pygidial fringes pale golden, the pygidial area ochreous, polished and shining; first sternite pale ferruginous, the second suffused ferruginous and the hypopygium entirely ferruginous. Length 5.1 mm.

Head black, ferruginous beneath; frons and vertex densely, confluently punctate, the punctures on the frons above the antennæ with the intervening surface smooth, not ridged; genæ rather more finely, confluently punctate, the malar space finely microrugulose distally; genæ defined posteriorly by a feeble, irregular carina extending from the base of the mandibles posteriorly towards the vertex, obsolescent near the upper margin of the eye; surface within the scrobes and frons above the antennæ with very sparse, pale pubescence, the rest of the frons and the vertex with short, sparse and scattered, long, erect, black pubescence; posterior margin of head, and the temples, with sparse, erect, pale pubescence; genæ and malar space with sparse, silvery pubescence, the genæ distinctly suffused with dark ferruginous medially: head beneath with scattered, pale pubescence: mandibles ferruginous, darkened towards the apex, the apex simple, the inner margin with two minute notches in the distal third and with a stout, obtuse tooth near the base: clypeus pale ferruginous, minutely punctate and clothed with long, pale pubescence, swollen medially and sub-tuberculate at the base between the antennæ, shallowly bi-emarginate when viewed from in front, and with a minute, median, sub-marginal tooth, the lateral angles of the median area sub-spinose: antennal tubercles ferruginous, smooth and shining; scape and pedicel pale ferruginous, clothed with sparse,. pale pubescence: flagellum piceous, somewhat ochreous beneath, first flagellar segment twice as long as the second. Head seen from above with the cheeks somewhat receding behind the eyes. Relative widths of head and thorax across the antennal tubercles 7.2:7.

Thorax ferruginous, the dorsum sub-rectangular, moderately finely and densely, confluently punctate, the median longitudinal ridge between the punctures more pronounced than the other ridges and extending almost unbroken from the pronotum to the median spine on the brow of the propodeon; dorsum clothed with sparse, sub-erect, and scattered, long, erect, black pubescence, the pubescence pale in the frontal area; pronotum with a distinct tubercle on the brow dorsally at one-sixth from the lateral angle; lateral margin of dorsum sub-dentate, with a strong, lamelliform tubercle in the mesonotal area: brow of propodeon with a strong median spine, strongly denticulate laterally, the brow slightly oblique from the lateral margin to the median spine, not transverse: posterior face of propodeon finely and densely punctate dorsally, where it is clothed with sparse, erect, fuscous pubescence, remotely punctate apically where the pubescence is pale; lateral margins of posterior face strongly dentate; pleural areas polished and shining, sparsely micropubescent;

squama of mesopleuron well developed, twisted; sides of propodeon polished and shining, finely and remotely punctate.

Abdomen black; first tergite extensively ferruginous basally, the colour extending to the posterior margin laterally, piceous dorsally, the anterior face with a few shallow, piliferous punctures and long, erect, pale pubescence, the dorsal face closely and minutely punctate, clothed with sparse, erect, piceous pubescence and with a median, transverse spot of appressed, pale golden, pubescence on the posterior margin; second tergite finely and densely confluently punctate, the punctures larger laterally but not as large as on the head or thorax, clothed with close, short, appressed, and scattered, erect, black pubescence and with an apical fascia, strongly widened medially, of appressed, pale golden pubescence, the lateral margins with sparse pale pubescence, the lateral pubescent line golden; tergites 3 to 5 finely, densely punctate, clothed with sparse black pubescence and a few scattered pale hairs; pygidial area lanceolate, smooth and shining, ochreous, the rest of the tergite ferruginous, finely and closely punctate, with pale pubescence, the pygidial fringes pale golden: first sternite pale ferruginous, feebly longitudinally carinate medially, faintly longitudinally rugose laterally, clothed with sparse, pale pubescence; second sternite with a distinct brow and with a short, median, longitudinal ridge basally, the surface shallowly concave on either side of the ridge, polished and shining with sparse, moderately fine, foveolate punctures and clothed with sparse, pale pubescence, with scattered, erect, pale hairs basally and with a thin apical fringe of pale pubescence, dark ferruginous except postero-laterally piceous and postero-medially pale; sternites 3 to 5 with fine, close punctures, scattered, pale, erect hairs and a thin apical fringe of pale pubescence; hypopygium ferruginous, finely and closely punctate and clothed with sparse, pale pubescence.

Legs ferruginous, clothed with sparse pale pubescence; calcaria pale.

Holotype.—Female, Bukit Kutu, 3,500 feet, Selangor, Federated Malay States, 31 January 1930. In British Museum of Natural History, London.

Paratype.—Female, Bukit Kutu, 3,300 feet, Selangor, Federated Malay States, 23 September 1932 (H. M. Pendlebury). In Selangor Museum, Kuala Lumpur, Federated Malay States.

Methoca clypeata sp. n. (Fig. 21).

Male.—Black; apex of mandibles ferruginous; tibiæ, tarsi, and wing veins fuscous; clypeus without a wide, membranous margin, produced medially into a strong spine;

antennæ strongly laterally compressed, flagellar segments 7–10 strongly arched beneath; prepectal suture of mesopleuron very strongly developed; propodeon coarsely reticulate.

Head: mandibles ferruginous apically, their apices acute, simple, armed with a strong subapical tooth on their inner margins, pubescent; clypeus finely and evenly punctate, clothed with long, pale pubescence, produced medially near the base into a strong, laterally compressed, spine; clypeus shallowly emarginate medially, without a membranous area across the emargination; frons finely and evenly punctate, the punctures more sparse laterally and towards the vertex, clothed with moderately long, pale pubescence; frons produced into a pair of strong tubercles above the antennæ, deeply channelled and polished and shining between the tubercles, the tubercles sub-carinate externally, their surface micro-rugulose; vertex with very fine, remote, piliferous punctures; ocellar triangle widest at the base, the distance of the lateral ocelli from the eyes about equal to their distance from each other, centre to centre; eyes slightly convergent towards the clypeus in their dorsal two-thirds, divergent ventrad; genæ strongly receding, finely and shallowly punctate, clothed with moderately long, pale pubescence; gula finely and remotely punctate, the median suture crenate, clothed with sparse, pale pubescence; scape micro-rugulose and pubescent, carinate on the inner apical margin, the carina extending obliquely on to the ventral surface for rather more than one-third, the carina ochreous; pedicel piceous and finely pubescent; flagellum finely pubescent, the pubescence black; flagellum strongly laterally compressed, segments 7 to 10 strongly arched beneath; relative lengths of pedicel and flagellar segments (measured in a straight line along their dorsal edge and from the inner aspect) 0.67; 1.5; 3.67; 4.0; 4.0; 3.67; 3.25; 3.0; 3.0; 3.67; relative widths of head and thorax including tegulæ 7.5: 5.25.

Thorax: tegulæ fuscous externally; pronotum remotely and moderately punctate, clothed with sparse, pale pubescence; lateral lobes of pronotum polished and shining posteriorly, strongly transversely costate in their longitudinal concavity; mesonotum finely punctate, medio-anteriorly without other sculpture, transversely rugulose between the punctures laterally and posteriorly*; scutellum divided from scutum by a deep and wide, costate sulcation; median area of scutellum cordate, polished and shining, with fine, remote punctures and sparse, pale pubescence; lateral concavity of scutellum finely, diagonally striate, longitudinally costate anteriorly; metanotum with a lunate median area, deeply foveate laterally, impunctate, with short, sparse, pale pubescence; propodeon coarsely, irregularly reticulate, merging into strong, oblique costæ laterally, clothed with sparse, pale pubescence; propectus shallowly, finely, remotely punctate, strongly longitudinally rugose in the neck region, clothed with sparse, pale pubescence; anterior concavity of mesopleuron bare, polished and shining, strongly longitudinally costate, bounded posteriorly by a strong, crenulate carina, which curves round dorsally dividing off a small, closely punctate, dorsal area: rest of mesopleuron remotely punctate, not clearly divided into epimeron and episternum, clothed with sparse, pale pubescence; median ventral suture strongly crenate, deeply foveate before the posterior margin which is sub-carinate laterally, sub-spinose inwardly; mesosternum small, polished and shining; metapleuron narrowly polished and shining antero-dorsally, the rest strongly longitudinally costate, somewhat obliquely ventrad; metasternum obliquely strigose from the mid-line.

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* Much of the sculpture is obscured by the pin, and part of the description taken from the paratype.

Abdominal tergites finely, remotely punctate and clothed with sparse, pale pubescence; first tergite with a rather feeble, median, longitudinal depression; articular surface of tergites crenate; first sternite strongly longitudinally rugose on the basal third, the rest with moderate, close punctures, the apical sulcation strongly crenate, clothed with sparse, pale pubescence; second and third sternites with moderate puncturation, sparse, pale pubescence and a thin apical fringe of erect, pale pubescence; basal portion of fourth to sixth sternites dull, micro-shagreened, closely and finely punctate on the posterior half, divided from the posterior portion by a crenate sulcation, the posterior portion polished, shining and remotely punctate, clothed with sparse, pale pubescence and with a thin apical fringe of pale pubescence; seventh narrow, dull, with a few punctures a sparse, pale pubescence, the margin deeply excised medially; aculeus laterally carinate, the carina forming a loop at the base ventrally, clothed with sparse, pale pubescence on the basal two-thirds; the sternites not divided by a median longitudinal impression.

Legs: coxæ, trochantera and femora, except at base and apex, piceous; extreme base and apex of femora dark ferruginous; anterior tibiæ fuscous extremely, pale ferruginous inwardly; tarsi pale ferruginous, strigil ochreous; intermediate tibiæ fuscous, calcaria ochreous, tarsi fuscous, pale ferruginous beneath; posterior tibiæ piceous above, fuscous beneath, calcaria ochreous, tarsi fuscous, ferruginous beneath; claws bifid near the base.

Wings transparent and iridescent, slightly infuscate apically, veins and stigma fuscous; cell *2nd* $R_1 + R_2$ longer than cell $R_4 + R_5$ Length 8.5 mm.

Holotype.—Male, Sĕlinsing-Gula Canal, Sĕlinsing, Krian, Perak, Federated Malay States, 24 June 1930. In British Museum of Natural History, London.

Paratype.—Male, Sĕlinsing-Gula Canal, Sĕlinsing, Krian, Perak, Federated Malay States, 24 June 1930.

Both were captured at moisture on leaves of *Colocasia* sp. in the early morning.

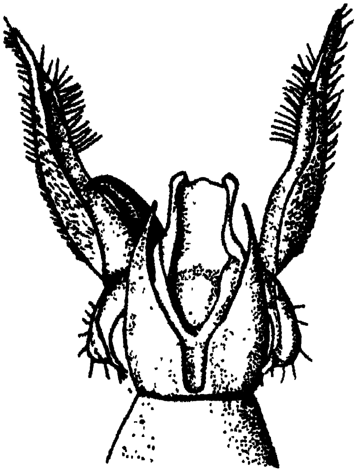

Fig. 21. Male genitalia of *Methoca clypeata* sp. n.

Only the genitalia of the paratype have been exposed. These are peculiar and figured above. They differ entirely from *Methoca violaceipennis* Cameron, in having the sagitta reflexed over the base of the squama.

XXIX. BIOLOGICAL NOTES ON SOME MALAYAN ACULEATE HYMENOPTERA I.

[Sphecoidea and Vespoidea.]

By H. T. PAGDEN, M.A.

The following notes were collected in my spare moments during four years' residence in the Malay Peninsula. Much of the information is merely confirmation of observations made by previous workers in other countries, some I believe is new.

Only species which have been definitely identified are dealt with but I hope later to be able to determine a considerable amount of other material concerning which I have some biological information.

I wish to record my thanks to Mr. O. W. Richards for assistance in determining some of the Hymenoptera and for reading my manuscript, to Mr. W. E. China for the Rhynchota, Dr. F. W. Edwards for Diptera, Dr. C. Ferriére for identifying the *Melittobia* and to Mr. W. S. Bristowe and Mr. H. C. Abraham for identifying the spiders.

Family TRYPOXYLIDÆ.

Trypoxylon bicolor Sm.

Like the other Trypoxylidæ this species preys on spiders and uses mud in the construction of its nest.

A specimen observed on 28.x.1931 was nesting in the handle of a Gillette razor which had been in use five and a half hours previously. A partially provisioned cell, from which five spiders were removed, had already been constructed. The wasp placed another three spiders in the emptied cell, sealed it up and proceeded to provision another cell with a further eight spiders. She was then captured and killed and the spiders were preserved in spirit. In each case the egg was deposited on the largest spider and was placed on the ventral surface of the abdomen parallel to the long axis of the body and fixed just behind the left hind leg.

The prey consisted entirely of Attidæ. One cell contained species of *Attus* and *Ligonipes* and the other 7 *Attus* sp. and one *Hasarius* sp. which bore the egg. The egg in the other cell became detached before the spiders were identified.

While visiting a padi field at Sungai Siakap in the Krian district of N. Perak I saw a *Trypoxylon*, which was almost certainly this species, attack a spider in a web. The spider grabbed the wasp and tried to throw a web round it but after a short struggle the wasp escaped and flew away, settling on a sugarcane leaf to clean itself, where I was able to examine it fairly closely, but I could not secure it as I had no net. The spider was captured and proved to be *Gasteracantha ? brevispinosa.*

T. bicolor appears to be generally distributed over the Peninsula but does not occur in the hills. I have captured it in Sĕlangor, Perak and Province Wellesley.

Pison argentatum Shuck.

This species nests in houses selecting such places as the crevices in the ventilators of doors, the ledges of weather boarding, the underside of drawers and tables or chairs where an angle is formed. I have also found it in eaves, in the angles of joists under houses built off the ground, under the noses of verandah steps, and inside the backs of books and files.

The cells are oval and the outer surface is rough. They are usually constructed of greyish brown mud but I have seen them constructed of yellowish mud and of mixtures of different colours. The walls of the cells are thick, 1·5 to 2·5 mm., and the cell inside is about 10 mm. long by 7 mm. wide. Sometimes the cells are nearly completely barrel shaped but more usually two sides are formed by the sides of the angle in which they are built. Usually a number is constructed end to end, I have seen as many as fifteen in a line, but occasionally they are solitary. Solitary cells are probably the product of individuals which have perished.

My own specimens of prey were accidentally destroyed and were not identified beyond the family which was Lycosidæ. Mr. W. S. Bristowe has very kindly sent me 36 spiders which he collected from three cells on a wall of Sea View Hotel, Singapore, in February 1932 and has identified as immature *Pardosa* sp. [Lycosidæ]. As there was a nearly full grown and one half grown larva of the wasp in this material the number of prey in each cell must be considerable. I have myself observed that the cells are crammed with as many spiders as they will hold.

Pupation occurs in a smooth cylindrical cocoon of dark brown silk, usually with some mud particles included in the outer layer. The cocoons measure 8·5 to 9 mm. long and 3·5 to 3·75 mm. wide. I have no information on the duration of the immature stages.

In Kuala Lumpur I have found the species to be fairly heavily parasitised by the Mutillid *Smicromyrme decora* (Sm.) and it also appears to be heavily attacked everywhere in the Peninsula by the Eulophid *Melittobia hawaiiensis* Perk. which also attacks the Mutillid. I have also observed the Bombyliid *Petrorossia ceylonica* Brun. ovipositing on the outside of the nests in Kuala Lumpur.

The species appears to be widely distributed and common in all the parts I have visited except the hills. I have specimens from Kuala Lumpur and Sĕrdang in Sĕlangor, Parit Buntar in Perak, and Singapore (Bristowe).

Pison erythropus Kohl.

On September 23rd, 1931, I saw a female of this insect in my bathroom. It appeared to be very interested in a crevice between two pieces of weather boarding and was endeavouring to force its way into this space. At first I though it was entangled in a fluffy spider's web which was constructed in this crevice but closer investigation showed that this was not the case. The web was cocoon shaped and the *Pison* was right inside it but it was moving about quite freely and its legs were in no way entangled. although the web adhered to the roughnesses of the skin of my fingers.

The insect was working quite slowly and methodically and without sound. Every now and then it disappeared completely behind the board and 13 minutes after I had first noticed it, it emerged backwards dragging a spider, which was offering considerable resistance, by one leg. When its abdomen was protruding about halfway out of the orifice of the web it curved it over the lip of the orifice and flexed its hind legs, gripping the edge of the web between its tibiæ and femora and using its abdomen as a lever. After emerging a little further it gripped the web firmly with its hind and middle legs and flexed its abdomen forwards, stinging the spider while it was still hidden, except for the one leg, behind the board. In a few moments it dragged the spider right out and stung it again twice. The wasp then emerged from the web, gripping the spider by its waist ventrally, and delivered another sting, apparently at the end of the abdomen.

In capturing the wasp and prey by placing a tube over them I found that the pressure of the tube on the loose strands of the web entangled the wasp slightly and it was only able to free itself when the pressure was released.

The spider proved to be a new genus and species which Mr. W. S. Bristowe is hoping to describe shortly under the name of *Mystes oonopiformis* Bristowe [Pholcidæ, Ninetinæ].

I have been unable to find the nest of *P. erythropus* nor have I ever captured a male.

This species is not as common as *argentatum* and I have only taken it sparingly at Kuala Lumpur and Parit Buntar.

Pison obliteratum Sm.

This insect builds a delicate mud nest and favours such places as the wall behind pictures or the backs of pictures themselves; it also seems to be fond of nesting in the folds of the pleated cloth of punkahs.

The cells are smooth, cylindrical, rounded at the base and recessed at the top to receive the base of the next cell. I have seen as many as ten cells in a column but usually only two or three are found together. They are very delicate and it is almost impossible to remove them without breakage. The wall is only about as thick as an ordinary piece of notepaper.

The prey consists of *Tetragnatha* sp., a spider which builds a horizontal orb web over small streams and ditches.

A smooth brown cocoon is woven for pupation.

One specimen I observed built its cells upside down in the fold of a punkah over my desk and the spider fell out as soon as they were put in. The wasp continued to work and sealed the empty cell when it proceeded to construct another inverted cell below the first but it disappeared without finishing this.

I have only found this species in the Krian district of North Perak.

Pison suspiciosum Sm.

The nests are found in houses usually under the ledges of tables and windows, sometimes behind pictures. They may be built in a vertical or horizontal row, in the latter case the long axis of the cells is also horizontal. I once found a number in the sleeve of a raincoat which had not been used for several days.

The cells are barrel shaped and rough externally but of a finer texture than those of *P. argentatum* which they otherwise resemble closely.

The prey consists chiefly of immature *Pardosa* [Lycosidæ] with a few immature Attidæ.

Pupation takes place in a smooth dark brown cocoon as is the case with the other species observed.

This species is probably widely distributed but I have only found it in Kuala Lumpur, Sĕlangor, and Parit Buntar, Perak.

Family STIZIDÆ.

Stizus reversus Sm.

This insect nests in loose sand, the burrows penetrating to a considerable depth. I have not succeeded in excavating them completely.

I only have one record of the prey which proved to be a new species of *Penthimia* Jassidæ. This was captured at the 22nd mile on the Ulu Langat road in the State of Selangor. The wasps were nesting in considerable numbers in a patch of loose sand near the river.

I have one stylopised female of this wasp but it appears to be a completely normal specimen as regards sexual characters. It was captured on the bank of the reservoir at 16th mile Ulu Gombak, Selangor.

Except for one male which I believe to belong to this species from Sĕlama, Perak, I have only found it in Selangor, nearly always close to water. Kuala Lumpur, Ulu Gombak 16th mile, Ulu Langat 22nd mile.

Family PHILANTHIDÆ.

Cerceris ferox Sm.

I have observed this *Cerceris* nesting in hard sandy soil at about 3,200 feet on Kĕdah Peak.

I first met with the species on 19th April, 1930 when it appeared to have almost finished nesting and only a few females were on the wing. One of these was captured carrying a Scarabaeid beetle of the genus *Microserica* and at the same time another was seen entering a burrow carrying a similar beetle.

I found considerable difficulty in excavating the burrows owing to the nature of the ground and, as I hoped to return at a later date, I did not repeat my attempts at excavation. Unfortunately no further suitable opportunity occurred so I am unable to say whether Scarabaeidæ form the main diet of the larvæ. A subsequent visit extending over the last three days of December 1931 and the first day of January 1932 proved just too early and none was found until the last day of my visit when a number of males emerged and one female was taken. The males were engaged in hawking up and down the bank where I had observed the nests previously. On the same day I found another colony, where I took a male and female, on a hard trodden jungle path where the soil was of the same sandy clay consistency.

The male of this species is very different in appearance from the female and was originally described as *Cerceris annandalei* Bingham (1903).

As far as I am aware this species has only been recorded from Kĕdah Peak in the Peninsula. It appears to be restricted to about the 3,200 to 3,300 contours, for, although I have searched for it at other likely places on the Peak I have found no trace of it elsewhere.

Family CRABRONIDÆ.

Dasyproctus buddha (Cam.).

I have seen one nest of this species found at Parit Buntar 21.vii.1930. It was constructed in a stem of the grass *Coelorrachis glandulosa* Staph., known locally as Pĕropok. The grass was growing near the bank of the Krian River and was being examined for Lepidopterous borers. The nest consisted of three complete cells and the beginnings of a fourth, and all contained young larvæ.

The prey were Diptera, Chloropidæ and Ortalidæ.

The unfinished cell contained three Diptera (1 Ortalid of a species which proved to be new and is not yet described and 2 Chloropids) and a young larva. It would appear, therefore, that a form of progressive feeding takes place and this suggests that the prey are killed outright. On the other hand no putrefaction had set in three days after opening the nest.

One larva was preserved and two others died on 25.vii.30 one being full grown, the other, the youngest, dying from starvation as I could not obtain suitable food. It refused to touch small Muscids and Tachinids but readily devoured Dolichopodids.

The larva has strongly developed mouth parts, clearly visible to the naked eye when full grown. It devours most of its prey except the wings, commencing at the head usually at the distal extremity of the labium. Feeding is rapid and the food colours the larva a deep purple.

The remaining larva pupated in a partially constructed cocoon of loosely woven brown silk on 30.vii.30. The cocoon was incomplete because, the stem being open, the larva continually moved out of its cell, spinning silk on the outside of the stem, and had to be put back.

The pupa is of normal hymenopterous form except that the abdomen has four finger-like processes on each side and an anal process. These do not become pigmented.

A male emerged on 7.viii.30 giving a pupal period of 8½ days. The larva, which was about a quarter grown when found, took nine days to pupation so that the total period of development is probably about three weeks.

The grass *Coelorrachis glandulosa* has solid stems and the stem in which this nest was constructed had completed flowering so was brown, hard and dry. The oldest cell was 10 mm. long, the next 9 mm. and the third 11 mm., the divisions between the cells being 2 mm., 2 mm., and 4 mm. thick respectively. The burrow was 3·75 to 4 mm. in diameter and the last completed cell was about 10 cm.

from the entrance which was cut in the side of the stem about half way along an internode. The stem was 8 mm. in external diameter at the point where the first cell was constructed. The divisions between the cells were made of pith.

As mentioned above, the stems of this grass are solid, the pith is fairly hard and the cuticle very hard, so that the work of excavation must be considerable. Whether the wasp itself is responsible for the whole work or whether it adapts the burrow of some other insect which bores in the grass as a larva, I have not ascertained. A Phycitine Pyralid and an Erotylid beetle, *Anadastus* sp. both inhabit the stems in the larval state and the wasp may use one of these, but as the burrow of the wasp was straight and those of the other insects are usually crooked, and sometimes branched, I think it probable that the wasp does the whole work of excavation.

There is a great discrepancy in size between the sexes of this insect the male being 6·0 to 6·75 mm. long with a forewing of 4·0 to 4·5 mm., the female being 11 to 12 mm. long with a forewing of 7·5 to 8·3 mm. The female was described by Bingham as *Crabro brookii* in 1896.

This appears to be a widely distributed species in the Peninsula and I have found it in most localities which I have visited in Sĕlangor and Perak. The male appears to be much more numerous than the female.

Family LARRIDÆ.

Notogonidia subtessellata (Sm.).

This is a well-known insect and its prey, Gryllidæ, has often been recorded These vary greatly in size and appear to be always immature specimens. I have seen it carrying quite small nymphs and also dragging last instar nymphs several times its own size. All the larger nymphs which I have seen it capture have been females.

On 28.ix.1930 I was afforded an opportunity of watching the courtship. Two males were seen chasing each other away from a crevice in a bank of heaped and dried mud from a padi field, and planted with *Zea Mays*, *Saccharum officinarum* and *Ipomoea batatas*. They were joined by a third male and the excitement became great. Shortly after the arrival of the third male, the antennæ of a freshly emerged female appeared momentarily over the edge of the crevice and were withdrawn almost immediately, when the female herself darted out and flew rapidly away over the water of the padi field. She was followed closely by two of the males but the third missed the psychological moment and did not even visit the crevice again. The flight was low but I was unable to follow the insects far. The whole episode lasted about five minutes.

The favourite nesting site appears to be in sheltered positions beneath bungalows, but I have also seen them burrowing in bare, open ground. The burrows do not appear to go very deep in those nests which I have opened.

Found everywhere and very common. I have specimens from cultivated and jungle areas and from sea level up to 3,500 feet on Bukit Kutu and 3,000 feet on Kĕdah Peak. From Sumatra I have it from 4,300 feet on the Karo Plateau.

Family MUTILLIDÆ.

Smicromyrme decora (Sm.).

This Mutillid is a parasite of *Pison argentatum* Shuck. and probably attacks other species of *Pison* as well.

I bred a number of males and one female from cells of *P. argentatum* collected in Kuala Lumpur in January and February 1928 but I could not get the female to oviposit in captivity.

I obtained a mating between this female and a male captured on the wing. Copulation lasted for 1 hour 22 minutes. The female was first gripped by the head but later the mandibles of the male were transferred to her neck. The fore and middle legs of the female were folded and covered by the fore legs of the male which gripped the sides of the female thorax, the male being supported high on its middle and hind legs. The female sting was fully extended to the left, pointing slightly forwards, during the whole process. I have observed exactly the same position of the sting in other species of Mutillids when pairing.

The pupa of both sexes has four small spines arranged in a square in the middle of the dorsum of the thorax. In the female pupa the sting is extruded and curved up over the dorsum of the abdomen the fourth tergite. There is also a tuft of setæ on the middle of the margin of the second tergite in the female pupa.

Smicromyrme decora, like its host, is subject to attack by *Melittobia hawaiiensis* Perkins.

I have taken males of this species flying about *Bambusa nana*, *Citrus Limonum* and *Citrus medica* var. *acida* and I believe that the females climb up these plants, and others, from some sexual instinct, their exposed position probably enabling the males to find them more easily. I have found females on *Citrus Limonum* and on Honolulu creeper

(*Antigonum*) several feet from the ground. They are more usually found running about on the ground, under houses, and on steps and window ledges where nests of *Pison argentatum* occur.

The species has been found at Kuala Lumpur, Serdang, Puchong and Ulu Gombak in Sĕlangor, and Parit Buntar and Sĕlama in Perak.

Summary of Species Observed.

Species.	Prey.	Parasite observed.	Localities in Malaya.
Trypoxylon bicolor Sm.	*Attus* sp. *Ligonipes* sp. *Hasarius* sp. *Gasteracantha ? brevispinosa*		Sĕlangor and Perak, F.M.S. Province Wellesley, S.S.
Pison argentatum Shuck.	*Pardosa* sp.	*Melittobia hawaiiensis* Perk. *Smicromyrme decora* (Sm.) *Petrorossia ceylonica* Brun.	Sĕlangor and Perak, F.M.S. Singapore, S.S. (Bristowe).
Pison erythropus Kohl.	*Mystes oonopiformis* Bristowe		Sĕlangor and Perak, F.M.S.
Pison obliteratum Sm.	*Tetragnatha* sp.		Perak (North) F.M.S.
Pison suspiciosum Sm.	*Pardosa* sp. Attidæ		Sĕlangor and Perak, F.M.S.
Stizus reversus Sm.	*Penthimia* sp.	*Stylops*.	Sĕlangor and Perak, F.M.S.
Cerceris ferox Sm.	*Microserica* sp.		Kĕdah Peak, 3,200-3,300 feet.
Dasyproctus buddha (Cam.)	Chloropidæ, Ortalidæ		Sĕlangor and Perak, F.M.S.
Notogonidia subtessellata Sm.	immature Gryllids		Found everywhere and Sumatra.
Smicromyrme decora (Sm.)	*Pison argentatum*	*Melittobia hawaiiensis* Perk.	Sĕlangor and Perak, F.M.S.

XXX. BIOLOGICAL NOTES ON SOME MALAYAN ACULEATE HYMENOPTERA II.

With Descriptions of New Species.

By H. T. PAGDEN, M.A.

(With twelve text figures).

The following notes form a continuation of the foregoing paper.

I have been unable to trace either of the two species of *Cerceris* here described in any of the Indo-Malayan material which I have been able to examine nor can I find a description of any species resembling them. It is always possible that some descriptions may have been overlooked and that I have thus created a synonymy. For this reason I have made the descriptions rather longer than would have perhaps been the case were I certain that I had consulted all the literature.

In drawing up the descriptions I have endeavoured to give a brief description of each sex, in which the general colour, size and main structural features are mentioned, before proceeding to the longer description. Many of the descriptions which I have seen have been so brief that it is almost impossible to be certain of the identity of the species without reference to the type. Where colour variations occur they are mentioned after the list of paratypes.

I wish to record my thanks to Dr. P. Blüthgen for determining the *Halictus* prey of *Cerceris kedahæ* and to Professor H. Bischoff for examining this *Cerceris* and comparing it with material in the Zoologisches Museum der Universität, Berlin. The Buprestid prey of *Cerceris langkasukæ* have all been described by Dr. W. S. Fisher in the *Journal of the Federated Malay States Museums*, Vol. XVII, Pt. 2, 1933, pp. 365, 369–374. Finally I wish to record my thanks to Mr. O. W. Richards for much help and encouragement.

Cerceris kedahæ sp. n. (Figs. 1–3).

Female.—Black. Clypeus with the margin sinuate. Clypeus, except marginally, a large spot at the base of the eyes inwardly and a spot at the base of the mandibles externally, flavous. Third and fifth abdominal tergites with a narrow, dusky yellow, marginal fascia. The apical margin of the second tergite extreme laterally and of the whole of the fourth, dark ferruginous. Wings strongly iridescent, mainly violet against a dark background, the costal margin from within the apex of the cell $Sc + M$ to the apex strongly infuscate, the rest of the membrane pale amber, transparent. Costa and stigma piceous, the other veins fuscous. The whole insect coarsely punctate, the metanotum less than elsewhere, the puncturation on the propodeon and petiole almost reticulate, basal area of propodeon longitudinally striate, metapleuron diagonally striate. Pygidial area ovate, widest basal to the middle, rugose, carinate laterally. Second sternite with a semilunar elevation at the base, sixth deeply rectangularly excised apically.

Length 11 mm.; forewing 9·5 mm.

Male.—Flavous markings on clypeus and frons reduced. Third to sixth abdominal tergites with marginal fasciæ, those on the third, fifth and sixth clear flavous, on the fourth dark ferruginous, flavous extreme laterally; third sternite with a submarginal flavous line extreme laterally.

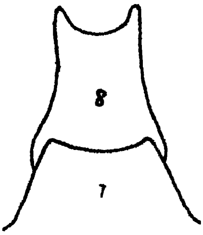

Fig. 1. *Cerceris kedahæ*, sp. n. Seventh and eighth sternites of ♂, outline.

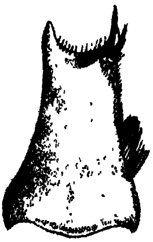

Fig. 2. *Cerceris kedahæ* sp. n. Eighth sternite of ♂, hairs shown on one side only.

Seventh sternite widely emarginate, eighth narrow and deeply emarginate. Pygidial area elipsoidal, two-thirds as wide as long, coarsely punctate and encircled by a carina.

Length 9 mm.; forewing 7·5 mm.

Female.—Head wider than thorax, eyes divergent towards the clypeus; clypeus medially convex, the margin recessed and sinuate, slightly arched medially and shallowly emarginate to the lateral tooth which is situated at one-fifth from the base of the mandible, thence receding to the base of the mandible, transversely furrowed premarginally. Labrum widely emarginate, laterally lobate, the lobes membranous. Mandibles stout, with a strong tooth on their inner margin near the base, and a sinuation distal to the tooth. Lateral ocelli three-fifths the distance from each other as from the eyes. Clypeus and frons below the antennæ shallowly punctate, the punctures about two diameters apart. Scape from above about as long as the pedicel and first flagellar segment together. Pedicel nodiform, first flagellar segment longer than the second, second to ninth subequal, tenth slightly longer than the first. Frontal carina not very prominent, terminating in a swelling below the antennæ, continued dorsally as a fine carina to the anterior ocellus. Concavity of frons round the antennæ finely, longitudinally striate, rest of frons, the vertex and temples, coarsely, contiguously punctate, the punctures finer and the surface finely longitudinally striate between, below the ocelli; genæ and gula with the punctures smaller, more remote, and arranged in more or less longitudinal lines.

Thorax dorsally, except the metanotum, coarsely contiguously punctate, pronotum longitudinally sub-rugose laterally; mesonotum with two, short, convergent, impressed lines anteriorly near the mid-line; metanotum with the punctures small, shallow and scattered; propodeon very coarsely punctate, almost reticulate, its basal area longitudinally striate; mesopleura coarsely, contiguously punctate, the pleural suture deep, costate; metapleura diagonally striate; meso-metapleural suture finely crenate.

Petiole wider than long, widest posterior to the middle, very coarsely, contiguously punctate; tergites 2 to 5 coarsely punctate, the second finely longitudinally striate at the extreme base on the articular surface; sixth tergite rugose, with a few punctures in its lateral concavity; pygidial area ovate, widest just basal to the middle, rugose. Petiolar sternite with a strong, median, longitudinal carina on the basal half; second sternite with a semilunar elevation at the base, the surface micro-rugulose with a few, small scattered punctures; sternites 3 to 5 progressively more closely and coarsely punctate, the fifth strongly swollen laterally; sixth sternite deeply, rectangularly excised at the apex, the lateral angles acute, spinose, laterally subcarinate the ridge continuous with the base of the spine.

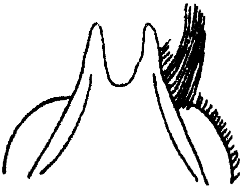

Fig. 3. *Cerceris kedahæ* sp. n. Sixth sternite of female, and lateral portions.

Black.—Clypeus, except along the margin, a large sub-triangular spot at the base of the eyes inwardly and a spot at the base of the mandibles externally, flavous; third and fifth abdominal tergites with an apical flavous fascia, that on the fifth not reaching the lateral margin; second and fourth tergites with the margin very dark ferruginous; antennæ beneath from the first flagellar segment to the apex, tegulæ, apical half of the anterior and intermediate femora anteriorly, less posteriorly, nearly the whole of the posterior femora, tibiæ basally and apically, and anterior and intermediate metatarsi basally, ferruginous; anterior and intèrmediate tibiæ anteriorly, flavous; tarsi fuscous, the anterior and intermediate tarsi paler apically and inwardly.

Clypeus densely clothed with silvery pubescence laterally; head, thorax and abdomen with sparse, fulvo-griseous pubescence dorsally, whitish laterally and ventrally, that on the mesonotum and petiole somewhat longer and more erect; propodeon with sparse whitish pubescence; pygidial area with a short fringe of dark fulvous hairs round the carina, the pencil of hairs on the lateral margin of the sixth sternite dark fulvous.

Male.—Similar to the female but smaller. Clypeal margin transverse, feebly arched, without a lateral tooth; lateral areas of clypeus minutely rugulose, with a few shallow punctures; facial markings reduced to a large median basal spot on the clypeus and a broad line on the inner margin of the eyes extending from the base of the clypeus to just above the antennæ; third, fifth and sixth tergites with marginal fasciæ, flavous, fourth tergite with the margin dark ferruginous, flavous laterally; second sternite with a sub-apical flavous line. Pygidial area elipsoidal, two-thirds as wide as long, coarsely punctate;

seventh sternite widely emarginate, eighth long and narrow, deeply emarginate, the posterior lateral angles acute and bearing a pencil of golden hairs. Clypeus with sparse silvery pubescence laterally, the fringe above the mandibles dense, golden.

Holotype.—Female. Kĕdah Peak, Kĕdah, Unfederated Malay States, between 3,200 and 3,900 feet, 19th April 1930. In British Museum of Natural History, London.

Allotype.—Male. Kĕdah Peak, Kĕdah, Unfederated Malay States, between 3,200 and 3,900 feet, 19th April 1930. In British Museum of Natural History, London.

Paratypes.—Kĕdah Peak, Kĕdah, Unfederated Malay States, 3,200–3,900 feet, 5 males and 8 females, 19th April 1930; 2 males and 3 females, 20th April 1930; 2 females, 21st April 1930. Federated Malay States, 1 female, Tanah Rata, Cameron Highlands, Pahang, 4,750 feet, 29th May 1931; 2 females, Taiping Hills, Perak, 3,700 feet and 4,000 feet, 13th September, 1931.

A male and female paratype have been deposited in the Selangor Museum, Kuala Lumpur, F.M.S.

Variation.—Size: The female paratypes vary in length between 9 mm. and 12·5 mm. with a forewing of 8 mm. to 10 mm.; the male paratypes vary in length between 8 mm. and 10·5 mm. with a forewing of 7 mm. to 8 mm.

Colour: In some females there is a small median flavous spot on the frontal swelling at the apex of the frontal carina. The fasciæ on the third and fifth abdominal tergites vary in colour between clear flavous and dusky yellow, those on the second and fourth between dark ferruginous and piceous.

Some males have a dull yellow, extreme lateral, apical spot on the second abdominal tergite; the fasciæ on the third, fifth and sixth tergites vary between clear flavous and dull ferruginous, those on the third and fifth usually being flavous, while the fourth tergite frequently has the apical margin very dark ferruginous medially and flavous laterally but may be entirely piceous; second sternite usually, but not always, with a ferruginous sub-apical spot laterally, the third usually with a sub-apical flavous line.

Biology: This insect appears to be exclusively a hill species, not occurring below about 3,000 feet. I found it to be plentiful on Kĕdah Peak from April 19th to 21st, 1930, between 3,200 and 3,900 feet, and captured two individuals carrying their prey, which has been identified by Dr. P. Blüthgen as *Halictus burmensis* Blüthgen and *Halictus* (*Pachyhalictus*) *reticulosus* D.T. (= *reticulatus*

Vachal). I have also found it at 4,750 feet at Tanah Rata, Cameron Highlands, Pahang, 29.V.31 and at 3,700 and 4,000 feet on Taiping Hills, Perak, 13.IX.31.

The burrows were numerous on Kĕdah Peak and were excavated in hard, compact soil at the side of the path leading from the Rest House to the summit. Unlike the burrows of *Cerceris ferox* Sm., which occurred in the same place, but over a limited area (*antea*, page 462), the nests of this species were excavated in level ground both on the path itself and in wash outs at the side. The site selected was always such that the burrows received the morning sun. On Taiping Hill only two specimens were seen and were captured outside their burrows which were in a precisely similar situation. Only one specimen was captured on Cameron Highlands and the nest was not found but the locality was similar.

Cerceris langkasukæ sp. n. (Figs. 4–8).

Female.—Black, variegated with yellow and dark ferruginous. Head wider than thorax. Mandibles at base, clypeus, margin of frontal carina, two spots on pronotum laterally, metanotum and markings on anterior and intermediate tibiæ and tarsi, flavous; a spot on either side of the second tergite anteriorly, a transverse fascia, widened laterally, at the apex of the third and fifth tergites, and a spot on each side of the third sternite, dusky yellow; petiole, second sternite anteriorly extensively, posteriorly narrowly, dark ferruginous, the third tergite tinged with dark ferruginous laterally. Clypeus feebly arched and notched medially, with a blunt tooth on either side of the mid-line premarginally, clothed with silvery hair. Fifth sternite with a deep median fovea near the margin, which is medially produced, arched and reflexed, bearing a prominent spine near the margin laterally; sixth sternite deeply excised medially, the lateral angles produced into a blunt tooth, carinate at the base inwardly, outwardly with a pencil of golden hairs at the base. Pygidial area elongate ovate, rugose.

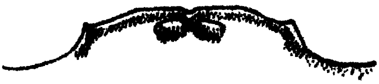

Fig. 4. *Cerceris langkasukæ* sp. n. Clypeus of ♀, showing margin and tubercles.

Length 7·7 mm.

Male.—Similar to the female in general characters. Projections on clypeus reduced to a feeble transverse swelling; sixth sternite laterally spinose, seventh feebly emarginate, eighth long and narrow, widely emarginate. Pygidial area rectangular, punctate.

Length 6·6 mm.

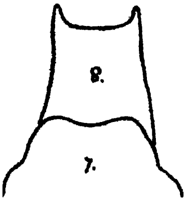

Fig. 5. *Cerceris langkasukæ* sp. n. Seventh and eighth sternites of ♂, outline.

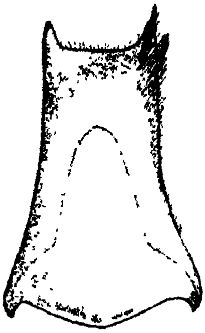

Fig. 6. *Cerceris langkasukæ* sp. n. Eighth sternite of ♂, hairs shown on one side only.

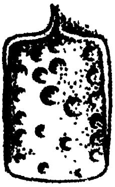

Fig. 7. *Cerceris langkasukæ* sp. n. Pygidial area of ♂.

Female.—Head wider than thorax, coarsely punctate, the punctures longitudinally confluent on the frons above the antennæ, gradually merging into transversely confluent on the vertex. Mandibles with a small tooth on their inner margin near the base. Clypeus convex, the margin slightly recessed, with rather more than the median half produced, medially notched, sinuate to the lateral angle, laterally emarginate and receding to the base of the mandible; pre-marginally there is a downward directed blunt tooth on either side of the mid-line. Labrum bilobed, punctate medially, lobes membranous. Eyes nearly parallel, slightly divergent towards the clypeus; lateral ocelli four-fifths the distance from each other as from the eyes.

Thorax coarsely, contiguously punctate except on the metanotum, where the punctures are fine and remote; pronotum longitudinally rugose laterally; basal area of propodeon defined by crenate furrows and with a feeble, crenate impression medially, the surface with a few longitudinal wrinkles; brow, sides and posterior surface of propodeon closely and coarsely punctate, the concavity transversely rugulose; mesopleura coarsely, contiguously punctate with a longitudinal sulcation filled with short pubescence at the upper third; metapleura diagonally striate; thorax ventrally coarsely and contiguously punctate except the metasternum where the punctures are smaller and scattered.

Petiole widest across the middle where it is as wide as long, coarsely, contiguously punctate; second tergite minutely diagonally ruguloso-striate at the extreme base, the rest, and tergites 3 to 5, coarsely, contiguously punctate, their margins crenulate; sixth tergite granular dorsally, concave and strongly punctate postero-laterally, the punctures distinct. Pygidial area elongate-ovate, widest at the basal third, nearly twice as long as wide, the surface dull and rugose with a few large punctures basally, laterally carinate. Petiole beneath somewhat longitudinally rugulose; second sternite coarsely, foveolately punctate except along the margin; sternites 3 to 5 punctate on their transverse swollen portions; fifth with a large, median, pre-marginal fovea, shining within, the margin medially produced and notched, arched from the surface, bearing a distinct spine near the margin laterally; sixth micro-shagreened, the margin deeply excised medially, produced into a tooth on either side of the excision, the inner margin of each tooth carinate basally, the carina extending on to the surface of the sclerite, laterally sinuate, with a pencil of golden hairs at the base of the tooth externally.

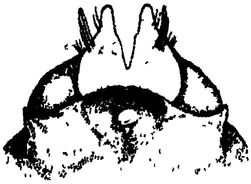

Fig. 8. *Cerceris langkasuka* sp. n. Fifth and sixth sternites, and sides of sixth tergite, ♀.

Black.—Mandibles flavous at the extreme base, the rest piceous; labrum fuscous, ochreous marginally and laterally; clypeus, except along the margin, two large spots at the base of the eyes inwardly, a small spot on the frons at the apex of the frontal carina, margin of frontal carina, two spots on the pronotum, a transverse line on the metanotum, a spot on the tegulæ antero-laterally, a spot on either side at the base of the second tergite, a transverse fascia, widened laterally, on the margin of the third and and fifth tergites, and a lateral spot on the third sternite, flavous: the abdominal markings all more or less suffused with ferruginous. Scape black, ringed with yellowish apically, pedicel black, flagellum piceous above, more or less ferruginous beneath. Petiole entirely, base of second tergite extensively, its sides and margin narrowly, ferruginous; third and fifth tergites laterally suffused with ferruginous. Anterior tibiæ and tarsi flavous, the tibiæ dark ferruginous posteriorly: intermediate tibiæ flavous anteriorly, ferruginous beneath and posteriorly, tarsi fuscous; posterior tibiæ piceous, tarsi dark fuscous. Wings pale luteous with a fuscous cloud on the costa apically, stigma and veins piceous.

Clypeus clothed with sparse silvery pubescence; vertex, genæ and gula with scattered silvery hair, the vertex with a few, longer, piceous hairs. Mesopleura with fairly long silvery-griseous pubescence, the pleural suture filled with short, dense pile: thorax beneath with short, decumbent, silvery pile. Sternites sparsely clothed with pale golden pubescence, longer and forming a fringe pre-marginally. Pygidial area with a short fringe of golden hairs laterally.

Male.—Similar to the female but differs in the following points. Clypeus not excised medially, edentate, the surface feebly transversally swollen: mandibles with a minute tooth about halfway along their posterior margin: sixth sternite transverse, with a spinose tooth laterally near the margin; seventh sternite narrowed to the apex which is shallowly emarginate; eighth sternite narrow, apically widely emarginate. Pygidial area rectangular, coarsely punctate, laterally carinate. Inner margin of eyes parallel: frons more extensively flavous above the clypeus than in the female; scape with a flavous spot at the apex above; second tergite without markings; posterior tibiæ flavous at the base. Pleural suture not deep nor filled with dense pile Pubescence of clypeus laterally dense, golden.

Holotype.—Female, Bukit Panchor, Kĕdah, Unfederated Malay States, 4th June 1930. In British Museum of Natural History, London.

Allotype.—Male, Bukit Panchor, Kĕdah, Unfederated Malay States, 8th July 1929. In British Museum of Natural History, London.

Paratypes.—Bukit Panchor, Kĕdah, Unfederated Malay States; 1 male 10th July 1929; 3 females 8th July 1929; 5 females 10th July 1929; 1 female 21st January 1930 (R. P. Kelly); 3 females 4th June 1930.

Two female paratypes in Selangor Museum, Kuala Lumpur, Federated Malay States.

Variation.—Three female paratypes have the thorax and second tergite wholly black, the flavous markings on the clypeus and frons reduced and the petiole very dark. Four female paratypes have the flavous spots on the second tergite and third sternite absent, and one of these has the facial markings reduced and the second tergite extensively ferruginous. Two females lack the flavous markings on the thorax and third sternite and one of them has the left half of the metanotum very dark ferruginous. The male paratype has the thoracic markings obscure, that on the metanotum in this and in the allotype consisting of two spots, not a flavous line as in the female.

Biology: A fairly extensive colony of this insect was found nesting at the head of Bukit Panchor Reservoir near Bandar Baharu, Kĕdah. The soil was for the most part of a loose sandy nature but in places it had been compacted by the cultivation of vegetables and it was here that the nests occurred. Although the burrows were not opened a number of prey, carried by returning females, was obtained. With one remarkable exception all the prey were beetles of the family Buprestidæ and all were new species. These have been described by Dr. W. S. Fisher (Jl. F.M.S. Museums Vol. XVII, Pt. 2, 1933, pp. 365, 369–374), and were as follows: *Agrilus langkasukæ* 8.VII.1929, *Agrilus pagdeni*, *A. tahanæ*, *Antharia kedahæ*, and *Trachys perakæ*, 4.VI.1930. The exception was a male Crabronid, *Hingstoniola fimbriata*, described on page 482.

This Crabronid was being carried by the last female taken and as the capture was such a remarkable one the two insects were placed in a pillbox for observation before killing. The Crabronid was either dead or very effectively paralysed and the *Cerceris* undoubtedly intended it as provision for her nest as she soon picked it up and carried it round with her in her endeavours to escape from the box.

That the Crabronid is an unusual prey is indicated by the other captures, and I believe this is the first record of a *Cerceris* preying on another Sphecoid. It is perhaps worthy of mention that the majority of *Cerceris* which are known to prey on Hymenoptera have an elevated area at the base of the second abdominal sternite which is possibly of some use in manipulating the prey. This structure is found in *kedahæ* but not in *langkasukæ*. It would be interesting if some entomologist in Malaya would examine the nests of this species and take a census of the prey.

Although I have not bred this species, field observations suggest that the life cycle is about three and a half months. Emergences were definitely noted in early July 1929, late February 1930 and early June 1930.

The female of **Methoca violaceipennis** Cameron (1899). (Fig. 9).

Female.—Head and abdomen, except the last segment, black and shining, last segment dark ferruginous; thorax, mandibles, scape, first three segments of flagellum and base of fourth, and the legs, ferruginous; intermediate and posterior femora and tibiæ darkened; mandibles with a small pre-apical tooth on their inner margin; clypeus swollen and acutely tuberculate medially, the margin arched and widely membranous; frons bituberculate above the antennæ; ocelli in an equilateral triangle; eyes reaching the mandibular articulation; cheeks strongly receding behind the eyes.

Length 4·55 mm.

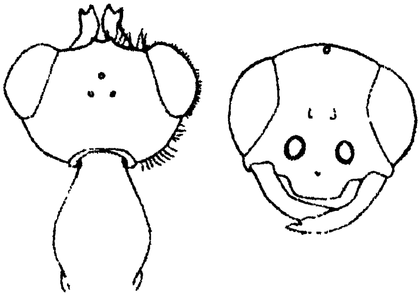

Fig. 9. *Methoca violaceipennis* Cam. Head from above, and face, ♀.

Head black, polished and shining, with very remote, fine, piliferous punctures; ocelli in an equilateral triangle: distance between centres of posterior ocelli equal to two-fifths of their distance from the eyes; eyes strongly divergent towards the clypeus, reaching to the base of the mandibles; median area of clypeus triangular in outline, acutely tuberculate medially above the transverse punctate line dividing the basal portion from the membranous margin; basal portion of clypeus strongly convex, defined distally by a transverse row of minute setiferous punctures; distal portion of clypeus membranous, fuscous in colour.

transversely microscopically rugulose, its margin widely arched; median width of membranous portion rather more than one-third the whole clypeus from base to margin; frons bituberculate above the antennæ, the tubercles carinate on the margin externally; surface of frons medially, above the tubercles, irregularly longitudinally micro-rugulose; concavity of frons above the antennæ very finely shagreened inwardly; upper frons with a short, indistinct impression extending from the anterior ocellus towards the micro-rugulose area of the frons; mandibles ferruginous, armed with a small, pre-apical tooth on their inner margin; antennæ pubescent, scape and first three flagellar segments, ferruginous, the apex of the second and third darker, fourth dark ferruginous, piceous apically, fifth to eleventh piceous; first flagellar segment shorter than the second, the second slightly longer than the third, ratio about 1:1.6:1.5. Relative widths of head, pronotum and second tergite 9.75:5.0:8.3.

Thorax ferruginous, polished and shining, with scattered, minute, piliferous punctures; neck of prothorax transversely strigose anteriorly, longitudinally crenulate posteriorly; pronotum entirely convex on the disc, with a median, transverse impression pre-marginally, the margin lobate laterally; mesonotum with a distinct fusiform convexity medially, its posterior margin slightly elevated and sub-carinate; anterior two-sevenths with some strong, longitudinal, carinate costæ, the posterior one-fourteenth with a median, lunate area, defined by a fine carina; propodeon, seen from above, widest at the posterior third. Thorax laterally with a few, fine, piliferous punctures, the neck finely transversely strigose, the constrictions longitudinally costate, the swelling above the intermediate coxæ diagonally micro-striate. Propectus with a very wide, elevated, median suture, rather more pubescent than the rest of the sclerite; mesosternum with a minute tubercle on either side of the mid-line in front of the intermediate coxæ; metasternum with similar but more prominent and closer tubercles, each bearing a small tuft of pubescence.

Abdomen polished and shining, black, except the last segment dark ferruginous; widest just before the apex of the second tergite; base of first tergite longitudinally rugulose; all the tergites with a few, widely scattered, minute, piliferous punctures; first sternite with a median channel on the granular basal half, the apical half flattened, polished and shining, with a few, minute, piliferous punctures; the remaining sternites with very minute, widely scattered, piliferous punctures, which tend to form a single transverse row sub-marginally on sternites 2 to 4, the punctures more numerous and tending towards a longitudinal arrangement on the hypopygium.

Legs ferruginous, the apices of the femora darker and the intermediate and posterior tibiæ almost fuscous apically; claws bifid near the base.

Allotype.—Female, Central Experiment Plantation, Serdang, Selangor, Federated Malay States, bred, 22nd May 1928 In British Museum of Natural History, London.

Paratypes.—Serdang, Selangor, Federated Malay States:—xii mile Ulu Gombak, Selangor, F.M.S., 1 on bare ground near hut by the reservoir, 5th February 1928: Serdang, 1 on a leaf of a lemon bush, 22nd March 1928: 2 on leaves of *Citrus Limonum*, 18th April 1928; 1 from a *Cicindela* burrow, 22nd May 1928; 1 on *Citrus medica* var. *acida*, 1st February 1929; 1, 2nd April 1929; 1, 24th April 1929.

One male and one female paratype in Selangor Museum, Kuala Lumpur, F.M.S.

Variation.—The paratypes vary in size between 6 and 8 mm. with a mean of 6·8 mm., all being larger than the allotype which only had a very small larva for provisions.

The mother of the allotype measured 6·33 mm. in length.

In some females the puncturation of the thorax is rather more coarse. Only in the allotype is the tubercle on the clypeus really acute, in the others it is probably worn down in digging. There is also some variation in the tubercles on the meso- and metasterna and in the frontal tubercles, all probably due to abrasion.

One male *Methoca violaceipennis* was bred from the same mother as the female described. Like the female it is small owing to the size of the prey. Four other males were captured in the field all at Serdang as follows: on ground under *Citrus Limonum*, 4th April 1928; on *Citrus Limonum*, 18th April 1928; on *Citrus Limonum*, 27th June 1928; at flowers of *Croton tiglium* Linn. 20th September 1928.

All the males differ from the holotype in the following points: the puncturation on the pronotum appears slightly finer and less dense, but that in the holotype is less obscured by pubescence owing to wear and the effect is largely due to this; the tegulæ and wings are paler, but the wings are variable, the Malayan specimens ranging from almost hyaline to distinctly luteous; the legs are slightly paler.

Biology: This insect prefers bare open ground exposed to the full sunlight, where it preys on the larvæ of Cicindelidæ as do the other members of the genus where the habits are known.

I found it plentiful at Serdang Central Experiment Plantation in 1928 and 1929. The males were usually found visiting the flowers of lemon bushes (*Citrus Limonum*) and occasionally flowers of *Croton tiglium*. Females were usually found actually on lemon bushes or lime trees *Citrus medica* var. *acida*), but were also observed running about on the bare ground.

The soil in these areas consists of clay, clay loam and sandyclay loam (the description being taken from the map of soil distribution in the Guide to the Government Experimental Plantation, 1931, Department of Agriculture, S.S. & F.M.S.).

Apart from Serdang I have only a single record of a female from a patch of hard, bare clay near the old reservoir at the twelfth mile on the Kuala Lumpur-Gĕnting Sempak road.

At Serdang the females were found to parasitise larvæ of *Cicindela fuliginosa* Dej. One specimen of this beetle was identified for me by Dr. Walther Horn, Director of the Deutsches Entomologisches Institut, Berlin-Dahlem, and another by Professor Kuntzen of the Zoologisches Museum der Universität, Berlin.

On April 18th, 1928 I captured a male and two females of this *Methoca* on lemon bushes at Serdang. I also dug up two small larvæ of *Cicindela fuliginosa*. These larvæ were placed in ready made holes in a tumbler of damp sand and each was fed with a fly. One of the *Methoca* females was introduced and the tumbler covered with muslin held in place by an elastic band. The *Methoca* was fed with sugar solution on strips of paper and remained healthy until she was killed on April 28th, ten days after she was captured.

My work prevented any observations being made except late in the afternoon when the *Methoca* was usually resting under some of the bark or moss with which she was supplied. On May 22nd, the sand was turned out and two *Methoca* cocoons, each with the cephalothoracic shield of a *Cicindela* larva attached to the anterior end, were found. The cocoons measured 13 mm. by 5 mm. and 8 mm. by 3 mm. both being widest at the anterior end. The smaller cocoon was opened very carefully and a fully developed, but very small female *Methoca* walked out. The other cocoon was kept and produced a male on May 25th.

Judging from the habits of the European *M. ichneumonoides* Latr., I think it probable that oviposition occurred soon after the mother was placed in the tumbler on April 18th which would give a life-cycle of 34 to 37 days.

I failed to obtain any oviposition from this female nor did her association with the male result in pairing, though the male became violently excited. The two were separated after twenty-four hours and the female was killed on May 27th.

Unlike *M. ichneumonoides* this species does not fill in the burrow of the *Cicindela* larva after ovipositing. Whether this practice is abnormal and was induced by the conditions in captivity I do not know. I should rather expect that if the burrow is normally left open some marauding ant would discover the prey and carry it off. On the other hand the soil in which the *Cicindela fuliginosa* burrows were found was very hard and the burrows were deep; under such conditions an open burrow might allow of better aeration and delay the growth of fungus, always an enemy of hymenopterous larvæ in the tropics.

The cocoons are similar to those of *ichneumonoides* in general appearance but differ from them in being quite fragile and almost transparent, and in having the anterior end recessed and closed with a flat cap, similar to that of a Chrysid cocoon, the depression being filled with the head and thoracic shield of the prey.

During a search for *Cicindela* larvæ on May 22nd 1928, one was dug up with a female *Methoca violaceipennis* Cameron clinging to it.

At Ulu Gombak, where I captured a single female on February 5th, 1928, the only *Cicindela* which I saw was *C. aurulenta* F., and this was very common. I think it probable that this species is parasitised as well as *fuliginosa*.

I have mentioned previously that many females were seen on lemon bushes and lime trees. These were often several feet above the ground level. The males visit the flowers and extra-floral nectaries of *Citrus* and I think the climbing habit of the females may have a sexual function in that it would render them more easily available to the males and would also provide a good jumping off place for a flight. The late Mr. E. B. Nevinson once told me that he had only taken males of *M. ichneumonoides in copula* on the wing. I have observed the same climbing habit among the females of other Mutillidæ, notably *Trogaspidia* and *Smicromyrme*, and I have also taken them *in copula* on leaves of trees, tall grasses and weather-boarding of houses, but never on the ground.

Smicromyrme kellyi Pagden (*antea*, p. 439).

Biology: Although I have no definite information on the host of this species it is always worth indicating the probable prey of Mutillids.

This *Smicromyrme* was very numerous in the locality where *Cerceris langkasukæ* was nesting on Bukit Panchor. The only other insect present was a Stizine wasp and this was exceedingly numerous burrowing in loose sand.

Females of the *Smicromyrme* were seen to enter burrows of both the *Cerceris* and of the Stizine but I am inclined to the view that it is primarily parasitic on the latter.

On 29th August 1930 I visited this locality and found a generation of the Stizine just emerging. The males were swarming in clusters round the nests waiting for the females to emerge. Freshly emerged females of *Smicromyrme kellyi* were busily engaged in searching about on the surface of the sand among the Stizine burrows and the males were much in evidence hawking about just over the surface and pouncing on the females, but copulation was not actually observed.

Crabro (Hingstoniola) fimbriata sp. n. (Figs. 10–12).

The species here described belongs to the subgenus *Hingstoniola* as designated by Turner and Waterston (A.M.N.H. Ser. 9, Vol. xvii, p. 180, 1926) except that the anterior femora do not bear a spine near the middle beneath but have a few setæ along the posterior ventral margin. In all other respects it agrees with the diagnosis of the subgenus and doubtless the spined anterior femora of *duplicata* Turner and Waterston, the only other known species of the subgenus, is a specific character.

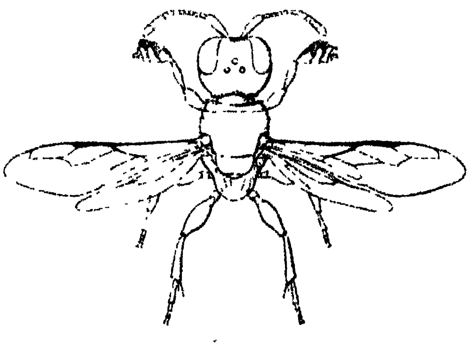

Fig. 10. *Crabro* (*H.*) *fimbriata* sp. n. ♂.

Male.—Form elongate, black, scape, two spots on the pronotum, four spots on the scutellum and a lateral spot on each of the first four abdominal tergites, flavous. Legs variegated with flavous and orange. Flagellum of antennæ orange, fimbriated beneath anteriorly with long pale golden hairs. Clypeus with dense silvery pubescence. Anterior tarsi flattened and dilated, white marked with black and bearing an anterior fringe of long piceous hairs. Intermediate and posterior metatarsi longer than rest of tarsus, the remaining joints transverse, wider than long, flattened but not dilated.

Length 6 mm.

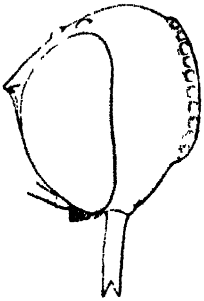

Fig. 11. *Crabro* (*H.*) *fimbriata* sp. n. Head from left side, ♂.

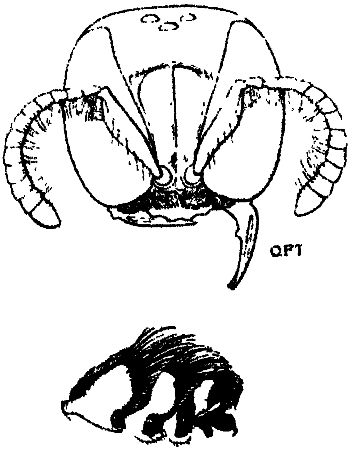

Fig. 12. *Crabro* (*H.*) *fimbriata* sp. n. Head from in front. Below: tarsal joints of right foreleg.

Clypeus medially strongly carinate, the apex of the carina slightly elevated but not reaching the margin. Margin of clypeus roundly produced and notched medially, widely emarginate laterally and with a tooth about half way to the lateral extremity. Eyes separated at the base of the clypeus by a distance about equal to half the length of the scape, the facets slightly enlarged. Frontal groove deep, strongly widened above, its lateral margins and brow carinate, the latter strongly so and having a few short costæ extending from it into the groove laterally and a median carina nearly reaching the base of the antennæ. Seen from above the brow carina is arched laterally, receding medially. Surface within the frontal groove shagreened and bearing some weak transverse striæ only visible when viewed from a fronto-lateral angle along their length. Head prolonged behind the eyes and not narrowed; posterior ocelli slightly further from the eyes and about two and a half times as far from the posterior margin of the head than from each other. Vertex and genæ slightly narrower than the eyes. Head margined posteriorly by a strong crenate carina. Eyes with a feebly developed crenulate circumocular carina. Dorsal surface of head rather coarsely granulate, the granulations becoming irregular reticulation near the brow, genæ and gula rather more finely granular.

Prothorax longitudinally reticulate with a slight median longitudinal depression. Mesonotum irregularly reticulate with four longitudinal carinæ anteriorly, the inner close together and extending about halfway, the outer nearly reaching the posterior margin, the space between them on the posterior third longitudinally striate. Parapsidal area transversely costate. A transverse crenulated groove between the mesonotum and scutellum, the scutellum longitudinally striate, medially cariniform, the lateral and posterior margin with a delicate crenate carina. Metanotum with a distinct dorsal surface, elevated posteriorly and enclosed by a carina, its surface granular, longitudinally costate; declivity of metanotum crossed by longitudinal costæ. Propodeon with four longitudinal carinæ, two near the middle, two outer, and one at each dorso-lateral margin; the areas enclosed by the two inner pairs crossed by transverse costæ with a few short longitudinal costæ at the base. The outer area with a few short transverse costæ inwardly, the lateral and posterior margins minutely, irregularly reticulate. Declivity of propodeon with a deep longitudinal groove, widened dorsally and enclosed by a carina, the surface within the groove shining and bearing a few weak transverse striæ, surface of declivity dull, shagreened, with a few transverse striæ on either side of the median groove at the apex, the whole enclosed by a carina except across the apex of the median dorsal area.

Propleura shagreened; mesopleura rugulose tending to longitudinal striæ dorsally and to irregular reticulation laterally and ventro-laterally, the surface shagreened within the major sculpture. Prepectus of mesopleuron defined by a weak foveolate furrow, pleural suture finely crenulate, mesepimeron longitudinally striate. Sides of propodeon and metapleuron shagreened and with indications of fine longitudinal striæ anteriorly and postero-ventrally.

First to fifth tergites of abdomen dull, shagreened: sixth slightly shining, with a dull shagreened band marginally; seventh polished and shining, the apical half minutely punctate. Fourth to last sternites concave.

Antennæ: scape somewhat swollen beneath at the apical third, first flagellar segment sub-pedicular, slightly longer than the second which is feebly concave above near its base; second to twelfth progressively longer, twelfth about three times as long as second. Eleventh segment with a small diagonally placed longitudinal fovea, carinate anteriorly beneath, twelfth oblique and slightly concave beneath.

Legs stout. Anterior trochantera and femora with a few setæ beneath, the femora carinate along their postero-ventral margin and slightly at the base of the antero-ventral, almost square in section, flattened beneath. Calcar of anterior tibiæ one-third the length of the tibia. Anterior tarsi strongly dilated, flattened and fringed anteriorly, the first segment slightly wider than its maximum length, second and third more than twice as wide as long, fourth comparatively very small and only a little wider than long, fifth almost normal, claws simple. Intermediate and posterior metatarsus longer than rest of tarsus. Calcaria of hind tibiæ stout and broad, the outer one about half as long as the metatarsus, sub-acute, the inner three-quarters as long as metatarsus, blunt.

Black, clypeus densely covered with silvery pubescence, mandibles piceous and shining, dark reddish brown on the inner surface near the tip. Scape flavous with a line of long silvery widely spaced hairs, which become closer near the apex, externally beneath and internally on the apical third. Flagellum with the first to fourth segments dark fuscous dorsally, the first and second shining, dull, granular and dark brownish orange beneath. Rest of flagellum orange; flagellar segments 1 to 12 with a fringe of a single row of long, curved, pale golden hairs along their length anteriorly, the first segment bearing a tuft of straight hairs on its postero-ventral face as well.

Pronotum with an elongate flavous macula on each side, dorsally; scutellum with a small spot on each side anteriorly where it joins the mesoscutum, and another, larger, nearly contiguous spot on its disc anteriorly, flavous. Tergites 1 to 4 each with a dorso-ventrally elongated flavous macula laterally. Extreme apex of abdomen reddish testaceous.

Coxæ black; anterior trochantera and femora flavous, tibiæ orange-brown with a flavous mark, widened at the base externally but not reaching the apex, above. Tarsi white, the first segment margined anteriorly and apically with black, the second with the black extending on to the disc of the posterior lobe, where it forms a spot; third with a diagonal median band and the anterior lobe, black; fourth and fifth black, the fifth dull, the rest polished and shining. First, second and third segments with an anterior marginal fringe of long piceous hairs which are as long as the segments are wide except on the first where the anterior margin is bordered by a short fuscous fringe, the hairs being long only on the distal border anteriorly. On their concave ventral surface the segments are clothed with long, decumbent, silvery-white hairs. Intermediate trochantera dark fuscous, ringed with flavous apically; tibiæ flavous with a median longitudinal fuscous mark above, orange-brown beneath; metatarsus pale flavous with an orange-brown stripe on its anterior ridge, second to fourth segments slightly wider than long, dark brown, claw joint piceous. Hind trochantera black; femora black with a flavous longitudinal mark anteriorly; tibiæ flavous above except at base and apex, fuscous laterally, orange brown beneath; metatarsus flavous above, base and apex fuscous, orange-brown beneath, second to fourth segments fuscous above, dark orange and each bearing a black spot beneath, claw joint piceous. Posterior calcaria orange.

Wings hyaline and iridescent, tegulæ, stigma and veins piceous.

Holotype.—Male. Bukit Panchor, Kĕdah, Malay Peninsula. Prey of *Cerceris spiniventris*, 4.VI.1930. In British Museum of Natural History, London.

This species is closely related to *Hingstoniola duplicata* Turner and Waterston from which it is distinguishable by the following characters: antennæ fimbriated, orange; anterior tarsi more dilated and fimbriated anteriorly; frontal groove not clearly transversely striate; no spine on anterior femora beneath; the form of the clypeus: the sculpture of the propodeon and by the colour.

Since this insect was described the abdomen has been broken and lost while it was out of my keeping. I publish the description, nevertheless, on account of the peculiar circumstances of its capture. The abdomen in the figure of the whole insect (figure 10), has been reconstructed from my measurements on the plan of that of *duplicata* Turn. and Waterst., which it closely resembled.

XXXI. BIOLOGICAL NOTES ON SOME MALAYAN ACULEATE HYMENOPTERA III.

[Apoidea.]

By H. T. PAGDEN, M.A.

(With one text figure).

The observations here recorded are very brief and are merely put forward as throwing some light on the habits of the bees mentioned and in some cases in support of observations of other workers. They appear in their present, incomplete form, because I do not expect to have further opportunities of study in the Malayan region.

I have to acknowledge my indebtedness to Dr. P. Blüthgen for determining *Halictus discursus* Cameron and for undertaking to describe the *Nomada* sp., and to Mr. H. M. Pendlebury, of the Selangor Museum, Kuala Lumpur, for determining my *Dianthidium apice-pilosum* Dover.

Halictus discursus Cameron.

Mem. Manch. L. Ph. Soc., XLI, No. 4, 1897, p. 100.

This bee was found nesting in fair numbers in damp, but very hard and cracked soil underneath my house at Parit Buntar, in Perak. The nests appear to go very deep for so small a bee, eight inches excavation failing to reach any cell and at this depth the burrow was lost. The burrows are usually in clusters and can be distinguished by the little wings of fine, excavated soil surrounding the entrance.

Although this insect was nesting in fair numbers I only secured a few specimens owing to the difficulty of capturing them. They did not visit any of the flowers in my garden and appeared to go fairly far afield in their search for provisions, perhaps visiting the flowers of *Melastomum malabathricum* which was growing in a neighbouring area of "lalang" (*Imperata arundinacea*). This area was reputed to be swarming with *Naia bungarus*, the hamadryad, and as I was not anxious to test the truth of this statement I did not penetrate it; certainly there was a number of the common cobra *Naia tripudians* present as they could frequently be seen coming out in the evening in their search for frogs and I killed a large number in my compound.

Halictus discursus is difficult to capture not only on account of its small size but because of its rapid zig-zag flight. In the particular case in question the matter was complicated by the necessity of crawling under my house, where light conditions were none too good, and netting them from a somewhat cramped position as they returned to their nests. It is perhaps not unnatural that only females were obtained.

My attention was first drawn to this bee by finding a specimen in my bathroom where a second specimen was caught not long afterwards.

The *Nomada* species is an inquiline of this *Halictus* and was found to be more numerous than its host. Both sexes were captured and a series was sent to the Selangor Museum. The sexes were found most numerous round the nests of the host and I frequently observed females entering and emerging from the host burrows, though they were also found on a small Composite plant growing as a weed under the house.

This *Nomada* is remarkable in the inconstancy of the number of submarginal cells in the fore wing, the left and right wings even varying in this respect in one individual.

Megachile disjuncta (F.).

Apis disjuncta Fabricius, Ent. Syst. ii, 1775, p. 328.

This insect was something of a nuisance in my house as it persisted in building its nests in awkward places. The favourite nesting site was in the bolt holes of my windows but not infrequently I found a series of cells in the backs of paper files. Various leaves seem to be used in the construction of the cells among others were those of *Cassia alata* and *Crotolaria saltiana*. Some very hairy leaves were used as well.

I have seen the adults visiting flowers of *Crotolaria*, *Tephrosia*, particularly the introduced *T. toxicaria*, *Coelosia* and *Coleus*.

This species is heavily parasitised by *Melittobia hawaiiensis* Perk. Out of one nest of five cells I only bred a single male, the other four producing *Melittobia*.

Bingham (Fauna of British India, Hymenoptera, Vol. I, p. 499) mentions that he has been *Parevaspis polynesia* Vach. (= *abdominalis* Sm.) entering the nests of *Megachile disjuncta*. I have also noted this at Parit Buntar but have not bred it as a parasite though it undoubtedly behaves in this manner. *Parevaspis polynesia* does not appear to be common anywhere in the Malay States. As far as I know only four specimens have been captured at all recently, all by myself. Two of these, a male and female from Sēlama, Perak, are very small, though undoubtedly this species.

Bingham, *loc. cit.* p. 480 remarks that the male of *Megachile disjuncta* is similar to the female but smaller and has the clypeus clothed with long, white pubescence. Actually the male is so different from the other sex that I am inclined to believe that he had not seen it at all. For this reason I append a brief description of it herewith.

♂. Black; frons and clypeus clothed with dense, long, pale fulvous pubescence, the clypeus shallowly emarginate medially, the margination only visible when the pubescence is damped or raised with a brush; labrum finely punctate, piceous, clothed with sparse griseous pubescence; vertex with short, sparse, pale fulvous pubescence; genæ with short, griseous pubescence merging into long, dense, pale grey pubescence on the post-genæ and gula; lateral ocelli almost as far from each other as from the eyes; inner margin of eyes with a deep groove from the base of the mandibles to the vertical angles; mandibles strongly quadridentate: vertex with fine, dense, shallow punctures, finer within the ocellar space and towards the frons; genæ with the punctures very shallow and longitudinally confluent; antennæ black, the apical segment compressed, polished and shining on the apical half posteriorly, dull and rufescent anteriorly.

Thorax clothed with dense, erect, fulvous pubescence dorsally, that on the pro- and mesonotum short, long on the scutellum metanotum and glabrous basal area, transverse triangular, dull: tegulæ with dense fulvous pile; pleura densely and finely punctate, clothed with less dense and shorter, pale pubescence merging into pale grey, almost white, pubescence ventrally.

First tergite polished and shining, with a few, scattered, moderate punctures, in the anterior concavity, dorsally with dense, fine, contiguous punctures and clothed with dense fulvous pubescence; second and third tergites finely granular resolving into punctures sub-apically, clothed with sparse, short, fuscous pile and with a narrow apical fascia of fulvous pubescence; fourth tergite densely punctate, clothed with sparse, short, erect black hairs, with a very narrow, fulvous fascia in the transverse basal impression and a narrow apical fascia of fulvous pubescence; fifth confluently punctate, with scattered pale fulvous and griseous appressed pubescence basally and laterally, intermixed with sparse, erect, black bristles; sixth granular, swollen medially on the declivity, the apical production strongly, medially notched, with a deep, median fovea basal to the notch, the ventral surface granular and strongly, medially foveate, sparsely clothed with minute, white hairs, and scattered, erect, black and longer, pale pubescence, laterally with sparse, appressed, pale pubescence; seventh finely granular, widely sinuate apically, the lateral angles rounded, with a stout tooth on the margin ventrally on either side of the mid-line, clothed with short griseous pile; sternites 1–3 with a moderately dense apical fascia of white pubescence; sternite 4 with a low, median, longitudinal ridge, the margin widely membranous, sinuate; visible portions of fifth and sixth sternites with dense, short, griseous pile; all the sternites clothed with short, sparse, appressed, pale pile, the surface finely and densely punctate.

Legs black, clothed with long, dense, pale grey pubescence basally; anterior and intermediate tarsi with a long, pale grey fringe posteriorly, the posterior tarsi with a similar fringe anteriorly; remaining pubescence pale fulvous to cinereous; claws ferruginous, piceous apically.

Wings luteous, infuscate apically beyond the cells; veins fuscous. Length 12 mm.

Described from a male bred at Parit Buntar, Perak.

Description mostly made at 40 diameters magnification.

Dianthidium apice-pilosum Dover.

Bulletin, Raffles Museum, No. 2, 1929, p. 55.

On 2nd February 1930 I observed a mud nest, which I believed to be that of an *Eumenes*, on a wall in the garden of one of the bungalows on Bukit Kutu, Selangor. Closer investigation showed this to consist of a cluster of four cells, which, if isolated, would have been more or less hemispherical. Each cell had a circular opening about one-quarter of an inch in diameter. Two of these cells were filled with spider's web: of the other two, one had a curved tube of translucent, amber-coloured resin, about one-half inch long, protruding from it. In shape this tube resembled those made by certain species of *Hoplomerus*. On opening the cell it was found to be divided into four compartments made entirely of resin, each compartment containing a fat, white larva. One of these larvæ was cut in opening the cell and one of the others subsequently died without spinning a cocoon. The fourth cell contained a mass of sticky resin.

The two surviving larvæ both wove cocoons of tough brown silk on February 5th; the imagines, both of which were males, emerging on March 8th and 11th.

This is the first record of the male of *Dianthidium apice-pilosum* and a brief description, based on that of the female, is given herewith.

♂. Head black; clypeus flavous; a narrow stripe, flavous below, ferruginous above, extending from the base of the clypeus along the inner eye margins almost to the base of the antennæ; mandibles amber, piceous at the apex, with three teeth; labrum and mouth parts amber; genæ and gula dark ferruginous; scape ferruginous, flagellum dark ferruginous beneath, piceous above. Pubescence (and puncturation) similar to female.

Thorax similar to the female except that the pubescence on the mesonotum anteriorly is distinctly pale golden.

Abdominal tergites 1–4 black, 5–7 bright ferruginous; sculpture of last three tergites coarser than on the preceding ones; puncturation on the seventh tergite confluent; tergite 5 of normal form, clothed with short, pale golden pubescence above, long, pale grey pubescence laterally; tergite 6 strongly transversely gibbous posteriorly, the gibbosity produced and overhanging the margin, which is recessed, clothed dorsally with short, laterally with long, pale grey pubescence; seventh tergite strongly transversely concave, the margin produced medially into a medially carinate tooth, the lateral extremities of the concavity defined by distinct ridge; first sternite without such a strong median longitudinal carina as in the female, piceous, dark ferruginous apically; second sternite dark ferruginous, pale apically, with a lateral tuft of long, pale grey pubescence; sternites 3 and 4 ferruginous, each with a lateral tuft of long, pale grey pubescence, the fourth concave, with sparse, shallow punctures and with a pair of very wide, bare, membranous lobes apically, the lobes as wide as the whole of the rest of the sternite, free and rounded laterally, widely arched on their inner angles and meeting at the base medially, translucent and milky in appearance; fifth sternite pale ferruginous, strongly concave, with fine remote punctures and sparse, pale pubescence, the apical margin piceous, thickened and finely but distinctly ctenate, with over 60 teeth, larger laterally, the extreme lateral one blunt; sixth sternite apically arched, widely emarginate laterally, pale ferruginous, very finely transversely rugulose baso-laterally, clothed with sparse, pale pubescence; seventh widely emarginate apically, narrowly lobed post-laterally.

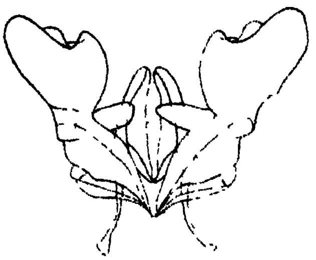

Fig. 1. *Dianthidium apice-pilosum* Dover. Male genitalia (No. 1711).

Wings as in the female.

Legs paler than in the female, ferruginous, the anterior ones lighter, the pubescence pale grey on the coxæ and trochantera, pale ferruginous on the anterior femora tibiæ and tarsi, and on the intermediate and posterior femora, black on the intermediate and posterior tibiæ and metatarsi and the extreme apex of the posterior femora; claws bifid, ferruginous.

Length 8 mm.

Male: Bukit Kutu, Selangor, 3,300 feet, bred 2 February to 11 March 1930.

Description made mostly at 40 diameters magnification.

Bees found visiting *Tephrosia toxicaria.*

A small plot of this plant on the Central Experiment Plantation at Serdang was found to be heavily attacked by certain insects, notably the beetle *Aræcerus fasciculatus* de Geer., and the moth, *Etiella zinckenella* (Treit.) affecting the seed pods. It was during an investigation of the pests of this crop that I had the opportunity to observe the insects connected with pollination.

Apart from *Apis dorsata* F. the commonest bees were *Megachile*, the following species being much in evidence; *M. atrata* Sm., *M. atratiformis* M-W., *M. conjuncta* and *M. tuberculata* Sm. Only females of these were observed. The common Xylocopids *Platymopoda latipes* (Drury) and *Koptorthosoma confusa viridissima* (Ckll.) were also numerous at the flowers. The only other bees observed were an unidentified *Nomia* and a *Halictus*. The latter is at present with Dr. Blüthgen, who is very kindly studying all my *Halictus* material.

XXXII. NEW NOMIOIDES FROM THE F.M.S. MUSEUM.

By P. BLUTHGEN (*Naumburg a.S., Germany*).

(With four text figures).

HYMENOPTERA-APIDÆ.

Subfamily HALICTINÆ.

1. **Nomioides malayensis** sp. n. (Figs. 1, 2).

♀ Head and thorax dark green, propodeum bluish-green; clypeus (including its side-pieces), scape in front, pronotum, tubercles, a spot on the nearly hyaline tegulæ, and sometimes two little transverse spots on the metanotum yellow; clypeus with two large, comma-like, piceous spots; scape behind piceous, flagellum piceous, brownish beneath; legs piceous, somewhat bronzy, tips of femora I and II, tibiæ I (with a brown stripe behind), base of tibiæ II (largely) and III (narrowly) yellow, tips of tibiæ II and III and the tarsi pale testaceous, basitarsi III with a brownish spot; wings hyaline, opalescent at the tip, veins and stigma pale amber, stigma with the interior edge brownish; abdomen piceous, 1st tergite with greenish metallic reflections, 2nd to 5th tergites each with a moderately large, yellow band, not reaching sides, the bands on 2nd and 3rd narrowed in middle and more or less widely interrupted, on 4th and 5th not narrowed and entire.

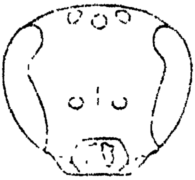

Fig. 1. *Nomioides malayensis* sp. n. face, ♀.

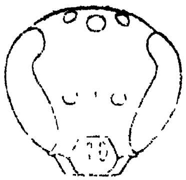

Fig. 2. *Nomioides malayensis* sp. n. face, ♂.

Hairs as in *N. variegata* Ol. ♀, blonde on head and thorax, testaceous and abundant on 4th and 5th tergites, pale testaceous on legs.

Mesonotum shagreened as in *variegata*, with the punctures somewhat more distant, coarser and much more conspicuous as in *variegata;* scutellum sculptured as the mesonotum, but more densely punctured. Propodeum as long as the scutellum, sculptured as in *variegata*. Abdomen strongly shining; 1st tergite three times as broad as long, each tergite with the end (1st narrowly, 2nd to 4th largely) depressed, and with the end of the disk distinctly swollen (roundly edged); sculpture of the tergites generally as in *N. valdezi* Ckll. ♀, 1st and 2nd with the posterior edge of the disk polished, 1st with the disk (as for the rest) faintly shagreened and very finely, (but 15 × conspicuously) punctured, the punctures scattered, 2nd and 3rd with the disk (except the roundish posterior edge), and with the extreme base of the depressed end copiously and microscopically, (but at 15 × perceptibly) punctured, 4th as 3rd, but more distinctly, punctured, 1st with the depressed end nearly polished, 2nd to 4th shagreened as in *valdezi* ♀, 1st and 2nd with the swollen end of the disk larger than in *valdezi* (as large as the depressed end of the tergite).

Length: 5–6 mm. Shape robust and broad.

♂ Colouring as in the ♀, but head and thorax bluish-green, and the metanotum and the abdomen without yellow markings, or 3rd tergite (perhaps sometimes 2nd tergite likewise) a little before middle with a widely separated pair of transverse, comma-like, yellow spots.

Sculpture of mesonotum and scutellum as in the ♀, the shagreen only a little more obsolete. Propodeum a little longer than the scutellum, with the sculpture about as in *variegata* ♂, posterior edge of the horizontal part polished. Abdomen claviform, tergites sculptured as in the ♀, but disk of 1st with (even 28 ×) obsolete and distant shagreen, each tergite with strongly depressed end. Sternites with copious, but moderately long, erect hair.

Length: 5 mm. Shape robust.

Types: 5 ♀♀ 4 ♂♂ from Beserah (Pahang, F.M.S., H. M. Pendlebury leg. 31.5.26), Holotypes ♀ ♂ in the F.M.S. Museum at Kuala Lumpur, Paratypes in the same and in my own collection.

2. **Nomioides communis** sp. n. (Figs. 3, 4).

♀ Head and thorax dark bluish-green; clypeus (including its sidepieces), scape in front, pronotum, tubercles, a transverse spot on hind part of mesonotum, two large spots on scutellum, a transverse band on metanotum, not reaching sides, a pair of spots on the hyaline tegulæ yellow; clypeus with a pair of large comma-like brown spots; legs piceous, tips of femora I and II, tibiæ I and II, bases (a third) of tibiæ III and basitarsi yellow, little tarsi pale testaceous, tibiæ II and basitarsi III stained with brown; wings whitish-hyaline, veins and stigma pale yellow; mandibles testaceous in middle; scape above piceous, flagellum piceous above, pale brownish (hazel-nut colour, darker basally) beneath. Abdomen dark piceous, nearly black, 1st tergite without greenish lustre, 2nd, 3rd and 4th with a pair of large, cuneiform, transverse yellow spots, the distance between that is on 2nd about a half, on 3rd a little more than a half, of the length of a spot, on 4th small; 5th with a broad, entire, yellow band basally.

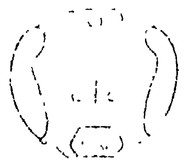

Fig. 3. *Nomioides communis* sp. n. face, ♀.

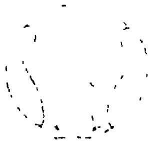

Fig. 4. *Nomioides communis* sp. n. face, ♂.

Hairs on head and thorax conspicuously shorter and sparser than in *N. variegata* Ol. ♀, blonde, on tergites very sparse (3rd nearly bare, 4th rather sparsely, 5th more abundantly and at the end thickly hairy, the hair pale brownish). Hair of legs whitish, with a little yellowish tinge.

Mesonotum and scutellum much more obsoletely shagreened than in *variegata* ♀, 15 × not perceptibly, and microscopically punctured. Propodeum nearly as long as scutellum and metanotum together, sculptured as in *malayensis* ♀.

Abdomen narrower than in *malayensis* ♀, 1st tergite only two and a half times as broad as long, tergites strongly depressed at the end, strongly shining, with the shagreen 15 × hardly perceptible, swollen end of disk of 1st not (or only in middle and 25 × extremely superficially), of 2nd (26 ×) feebly shagreened, 1st without, 2nd (25 ×) with very shallow and obsolete 3rd and 4th (25 ×) with distinct punctures.

Length: 4.5 mm.

♂ Head and thorax dark bluish-green, metanotum black; clypeus (including side-pieces), mandibles (with red tip), scape in front (in little specimens often a more or less large spot at the base only), pronotum laterally and tubercles yellow; mesonotum, scutellum and metanotum without yellow markings; tegulæ pallid brownish, with a brown spot at the interior edge; wings as in *malayensis* ♂; antennæ as in the ♀, flagellum frequently darker (light brown) beneath or at least the last joint darkened; legs dark piceous, tips of anterior femora, knees of intermediate and posterior femora, tibiæ I and II and the base (a third) of III yellow, metatarsi whitish-yellow, little joints of tarsi pale testaceous; abdomen dark piceous (nearly black); without yellow markings.

Antennæ as long as in *variegata* Ol. ♂. Mesonotum and scutellum (15 ×) polished and impunctate (26 × mesonotum anteriorly in centre conspicuously, at the rest obsoletely, shagreened and very finely, but conspicuously, punctured). Propodeum as in the ♀, but the shagreen more obsolete, the edge of horizontal part polished.

Abdomen claviform, 1st tergite hardly two times as broad as long, the tergites with broadly and strongly depressed ends, tergites (15 ×) without perceptible sculpture, (26 ×) sculptured much as in the ♀, but swollen end of disk of 1st polished, of 2nd hardly shagreened in middle, polished laterally, the tergites (including 1st) with conspicuous punctures.

Hair still more sparse as in the ♀; sternites with sparse hair.

Length: 4–4.5 mm.

Types: 4 ♀♀ and a long series of ♂♂ from Kuala Lumpur (Selangor, F.M.S., May and June 1926, at flowers of creeper, *Antigonum leptopus*, H. M. Pendlebury leg.), Holotypes in the F.M.S. Museum at Kuala Lumpur, Paratypes in the same and in my own collection.

3. **Nomioides borneana** sp. n.

♀ Head and thorax dark green; metanotum and abdomen dark piceous, 1st tergite with green reflections, tergites with slightly brownish ends; antennæ, legs and mandibles chestnut, the latter with red tips, flagellum yellowish-brown beneath; lemon-yellow are clypeus (with two piceous comma-like spots), its side-pieces, scape in front, pronotum, tubercles, a spot on the tegulæ, two large roundish spots on scutellum, a transverse spot on metanotum, a pair of triangular spots immediately at the bases of 2nd and 3rd tergites, (the space between them is on third as great as the breadth of a spot, on second somewhat greater), a broad band on 4th and 5th, concave behind on 4th, entire on 5th, tips of femora I and II (a fourth), tibiæ I, base and posterior edge of tibiæ II; wings greyish-hyaline, veins and stigma pale blond, the latter with darker inner margin; anterior and middle tarsi and little joints of posterior tarsi testaceous.

Head, thorax above, abdomen and posterior legs with brown, sides of thorax, 5th and 6th tergites, anterior and middle legs with paler (more yellowish) hair.

Sculpture generally as in *valdezi* ♀, but the disk of 1st tergite somewhat stronger and more densely shagreened and the end of the disk of 2nd (15 × distinctly) in the same manner shagreened as the end of the tergite. Shape as in *valdezi* ♀, but the ends of the 1st and 2nd tergites less depressed and distinctly less sloped from the end of disk.

Length: 5.25 mm.

Very similar to *valdezi* ♀, especially by the colour of legs and hair, but differing by the green lustre of 1st tergite and the sculpture of tergites.

♂ Head dark green, supraclypeal area more brassy-green, thorax greenish-blue or blue, metanotum piceous, with greenish reflections, abdomen dark piceous, nearly black, 1st tergite with greenish-blue or blue lustre, tergites at end slightly brownish; lemon-yellow are clypeus (usually with two piceous puncture-like spots), its side-pieces, scape in front, pronotum laterally, tubercles, femora I and II at tips, tibiæ I (except the posterior edge), tibiæ II and III at bases, tibiæ III at ends, tarsi (joints 2 to 5 suffused with testaceous), two oblong, narrow, transverse spots at extreme base of 3rd tergite, (very variable in size, sometimes wanting), often two little spots at base of 2nd tergite; mandibles without yellow; antennæ dark chestnut, flagellum dark yellowish brown beneath; wings slightly greyish, stigma testaceous, veins and inner margin of stigma light brown. Hair as in the ♀.

Shape more robust than in *valdezi* ♂, abdomen broader, especially 1st tergite, antennæ shorter and stouter, (3rd joint of flagellum only a little longer than broad, middle joints square). Sculpture generally as in *valdezi* ♂, but vertex less shagreened and more shining, mesonotum (15 ×) polished, but at 25 × obsoletely shagreened all over, including behind middle; disk of 1st tergite more strongly shagreened, end of disk (25 ×) with very feeble, depressed end of 1st tergite (15 ×) with obsolete shagreen, 2nd tergite on the swollen end of disk and on the depressed end weakly shagreened.

Length: 5.25–4.5 mm.

Types: 2 ♀♀ and 28 ♂♂ from Kudat (Brit. North Borneo, H. M. Pendlebury leg., September 1927), Holotypes in the F.M.S. Museum at Kuala Lumpur, Paratypes in the same and in my own collection.

Key of the Indo-australian species of the *variegata*-group.

♀♀

1. 1st tergite black or dark piceous, without green reflections 2
   1st tergite with green lustre 11
2. 1st tergite with yellow markings 3
   1st tergite without yellow markings 5
3. Mesonotum behind in middle with a yellow transverse spot; scutellum yellow. **hedickei** Blüthg.
   Mesonotum and scutellum without yellow .. 4
4. Scutellum black with purple lustre; tergites each with a pair of little yellow spots. **obscura** Friese.
   Scutellum green; 1st, 2nd and 3rd tergites with a more or less largely interrupted 4th and 5th each with an entire yellow band. **appendiculata** (Cam.)
5. 1st tergite uniformly shagreened all over .. 6
   End of disk of 1st tergite polished 7
6. Mesonotum behind in middle with a yellow transverse spot; scutellum with yellow spots. **cerea** (Nurse) (**divisa** Cam.)
   Mesonotum behind with two little yellow puncture-like spots; scutellum green. **cerea** (Nurse) var.
7. Mesonotum more distinctly shagreened, little shining; tergites more shining, less shagreened, especially disk of 1st, that is undulatingly transverse lineolate and microscopically and sparsely punctured, puncture of 3rd and 4th much more sparse. Hair of 4th much more scanty, pallid, that of hind tibiæ and metatarsus pale yellowish. Wings whitish-hyaline, veins and stigma pale yellowish. A spot on mesonotum behind, two spots on scutellum, metanotum, tibiæ I and II, base of III and all metatarsi yellow; 2nd, 3rd and 4th tergites each with a pair of yellow cuneiform spots, 5th with yellow basal band. 4.5 mm. **communis** sp. n.

Mesonotum less shagreened, much more shining; tergites less shining, with a silky lustre, disk of 1st and 2nd more shagreened, that of 1st very thickly and microscopically punctured, puncture of 3rd and 4th likewise much more dense. Hair of tergites 3rd and 4th much more abundant, (on 4th twice more), brown on 4th and on hind tibiæ and metatarsi. Wings brownish-hyaline, veins darker, stigma with darker inner margin. Middle and hind tibiæ and hind metatarsi often entirely brown, (without yellow markings) 8

8. Scutellum and metanotum without yellow markings.

valdezi Ckll. var. **immaculata** Blüthg.

Scutellum and metanotum more or less yellow 9

9. Scutellum with a pair of yellow spots, metanotum in middle yellow. Bands of 2nd and 3rd tergites broadly interrupted.

valdezi Ckll., typical form.

Scutellum entirely yellow. Band of 3rd tergite entire 10

10. Mesonotum behind (in front of scutellum) with a yellow spot.

valdezi Ckll. var. **flava** Blüthg.

Mesonotum without yellow.

valdezi Ckll. var. **samarensis** Ckll.

11. 1st tergite with a roundish yellow or white spot at each side 12

1st tergite without marking 13

12. Markings of body and hind tibiæ yellow.

variegata (Ol.)

Markings of body and hind tibiæ ivory.

variegata (Ol.) var. **pseudocerea** Blüthg.

13. 1st tergite (26 ×) uniformly shagreened .. 14

1st tergite at least on end of disk polished .. 15

14. Mesonotum very distinctly shagreened, faintly shining, with a silky lustre. Flagellum dark piceous beneath; wings greyish, veins and stigma blond, inner margin of the latter and subcosta brown; hind tibiæ brown, yellow on base only. Hair of legs brown.

dapitanella Ckll.

Mesonotum nearly smooth, very shining. Flagellum beneath pale hazel-nut; wings whitish-hyaline, veins and stigma yellowish; hind tibiæ extensively yellow. Hair of legs whitish.

perditella Ckll.

15. 1st tergite entirely polished. Mesonotum behind with a transverse yellow spot, scutellum with a pair of such. **formosicola** Strd.

1st tergite polished only at end of disk, shagreened for the rest, (very faintly at the depressed end, that is nearly smooth) .. 16

16. Scutellum with a pair of yellow spots, metanotum yellow stained; hind femora and tibiæ and mandibles without yellow. Hair on thorax above and on hind legs brown. Mesonotum less shagreened, more shining; disk of 1st tergite more shagreened, duller, without punctures; hind part of disk of 2nd faintly shagreened. Face shorter and broader, shape more slender. **borneana** sp. n.

Scutellum and metanotum without yellow; tip of hind femora, base of hind tibiæ and mandibles yellow. Hair on thorax above and on hind legs yellowish. Mesonotum more shagreened, duller; disk of 1st tergite faintly shagreened, shining with scattered, very feeble, (but 15 × distinct) punctures; hind part of disk of 2nd polished. Shape robust especially the broader abdomen. **malayensis** sp. n.

♂♂.

1. Tergites without yellow markings 2

At least one tergite with yellow or white markings 6

2. 1st tergite uniformly shagreened, dull, with a silky lustre. **dapitanella** Ckll.

Disk of 1st tergite very shining, more or less polished at end 3

3. 1st tergite with green or blue lustre 4

1st tergite clear black. Mesonotum very shining, nearly polished 5

4. Mandibles dark piceous. Mesonotum in middle widely nearly polished (15 × very obsoletely shagreened); depressed end of 1st and end of disk of 2nd tergites with very feeble, (but 15 × distinct) shagreen; disk of 1st more shagreened, without punctures. Middle joints of flagellum square. **borneana** sp. n.

Mandibles yellow. Mesonotum uniformly (and 15 × very distinctly) shagreened, dullish. Depressed end of 1st and end of disk of 2nd tergites polished; disk of 1st obsoletely shagreened, with scattered very feeble punctures. Middle joints of flagellum by a fourth longer than broad. **malayensis** sp. n.

5. Mandibles dark piceous. Punctures of mesonotum stronger. Hair of sternites more abundant. **valdezi** Ckll. var. **obsoleta** Hed.

Mandibles yellow. Punctures of mesonotum finer. Hair of sternites sparser. **communis** sp. n.

6.* 1st tergite either wholly or at least on depressed end (or also on end of disk) polished 7

Disk and depressed end of 1st tergite (25 ×) uniformly shagreened 10

7. 1st tergite black. **valdezi** Ckll.
1st tergite with green or blue lustre 8

8. 1st tergite polished all over. **formosicola** Strd.
1st tergite shagreened at least on disk (except its end) 9

9. **borneana** sp. n. and **malayensis** sp. n. (see No. 4).

10. 1st tergite black 11
1st tergite with green or blue lustre 12

11. 3rd joint of flagellum square. **cerea** (Nurse).
3rd joint of flagellum somewhat longer than broad. **horni** (Strd.).

12. Green lustre of 1st tergite very feeble. Mesonotum even in front (25 ×) quite obsoletely shagreened. **perditella** Ckll.

1st tergite with distinct metallic lustre of the same colour as the mesonotum. Mesonotum at least in front distinctly shagreened 13

13. Tergites with yellow markings. **variegata** (Ol.).
Tergites with white markings.
variegata (Ol.) var. **pseudocerea** Blüthg.

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* Probably *N. nanensis* Ckll. ♂ runs there, but for want of any statement on the sculpture of tergites, it is impossible to clear up, whether it falls in No. 7 or in No. 10.

XXXIII. THE DEVELOPMENTAL STAGES OF SOME MALAYAN RHYNCHOTA.

By N. C. E. Miller, F.R.E.S.

(With forty-two figures).

Many Rhynchota, especially those species which are not known to be of economic importance, have not been studied very closely except in the adult stage, therefore the following observations, and descriptions of the early stages, although somewhat fragmentary in some cases, are communicated with the hope that something of value may be added to our knowledge of the Order.

Rhynchota, so far as I have been able to judge from experience in Malaya, are difficult to rear in captivity, however closely the surroundings in which they are kept are approximated to natural conditions; consequently it is not surprising that their developmental stages are imperfectly known.

The provision of the appropriate food-plant constitutes another obstacle, particularly when it is desired to keep alive for the purpose of obtaining ova, individuals which have been captured either on the wing or while resting on some plant other than their natural food-plant.

It has been found that some Hemiptera are extremely susceptible to a change of altitude as it usually inhibits oviposition, or, if oviposition should take place, only a small percentage of the ova hatch. A change of temperature most probably plays an important part in preventing ova from hatching. Instances of this have been observed when ova are brought down in the course of a few hours from an altitude of 3–4000 ft. above sea level to approximately 100 ft. above sea level, which means, in this country, a rise in temperature of 10 to 15 degrees Fahr.

In certain cases too it has been observed that only a small percentage of ova in a batch emerge, wherever they may have been deposited.

One of the most interesting events (from the observer's point of view) in the life of a hemipteron is the act of eclosion, to effect which the sclerotised portion of the membrane investing the embryo is brought into play to rupture the chorion or to prise off the operculum.

Those Pentatomidæ which have come under my notice, possess an egg-burster which is triangular, T-shaped, with shorter projections laterally (called transverse arms in this paper) at the end opposite the longer projections, or resembling a type of anchor, with the area between the transverse arms slightly less sclerotised. The portion between the transverse arms (called the longitudinal arm) bears a low, rounded, or mucronate projection at one or at each end, on the side which comes into contact with the chorion of the ovum.

Regarding the position of the egg-burster in Pentatomidæ before eclosion of the larva, Weber, (1), gives a figure taken from Heymons (Uber einen apparat zur öffnung der Eischale bei den Pentatomiden, Z. wiss. Insectenbiol. 2, 1906) of the ovum of a Pentatomid, with the outline of the embryo visible, and shewing the egg-burster *in situ*. It would appear, however, that the position as given in this figure is not strictly accurate, since examination of an ovum by dissection, just before eclosion will shew that the longer transverse arm lies along the base of the head and the longitudinal arm lies on the vertex. In the case of those egg-bursters having a transverse arm at each end of the longitudinal arm, the shorter arm lies on the vertex between the eyes of the embryo.

The initial split made in the chorion by the larva about to hatch, is effected by the mucronate projection midway on the transverse arm. A fissure having been made, this projection now serves as a lever, holding back the edge of the operculum (or the chorion of a spherical ovum), and then, after a few minutes, the fissure is sufficiently enlarged to allow of the whole of the egg-burster to project outside, and to allow the processes on it to engage with the two edges of the split surface.

When the egg-burster is in this position it prevents the edges of the fissure from coming together again, during the time the larva is preparing itself for a further effort to widen the fissure or push off the operculum.

This having been done, the larva, after wriggling partly out of the ovum has now to rid itself of the investing membrane. It does this, in the case of *Pycanum rubens*, and most probably of other species, by inflating the cervical membrane behind the head, causing the membrane to rupture, whereupon it speedily releases its head and legs, and with the latter, drags itself out of the shell.

The membrane now dries and shrivels back into the empty shell to which the operculum usually remains attached in the case of Pentatomid ova, but falls off completely in the case of certain Coreid ova. With spherical ova, of some Tessaratominæ, for example, the chorion soon becomes distorted after the eclosion of the larva.

As a rule, about an hour elapses after eclosion before the pigment of the larva is fully developed. Before then the colour is whitish, pink, or red.

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(1) Weber. Biologie der Hemipteren. Berlin. 1930.

In the species of Coreidæ which I have had under observation, the egg-burster has the form of an arcuate or sinuate rod with an irregularly thickened or more highly sclerotised area in the middle, where also is sometimes a short mucronate projection.

The larvæ of *Physomerus grossipes* and *Acanthocoris scabrator* lie on their backs in the ovum, and when hatching do not use their legs to free themselves until almost out, when the posterior pair of legs is employed as levers.

The arrangement in which ova are deposited varies to a certain extent, but in each subfamily it is usually of one type. In the Plataspidinæ, the rule is for the ova to be arranged in two contiguous parallel rows with the longer axes of the ova forming an angle of about forty-five degrees. Members of the four subfamilies Scutellerinæ, Pentatominæ, Asopinæ and Phyllocephalinæ, as far as my acquaintance with them goes, deposit their ova in compact groups with the longer axis of the ovum vertical.

The grouping arrangement is also followed by those Tessaratominæ which have been studied, and what is somewhat striking, the number of ova in a batch is frequently constant, as is also the number of ova in each row; for instance, *Pycanum ponderosum* has been observed on several occasions to deposit ova in rows of 3, 4, 4, 3.

The Dinidorinæ deposit their ova in chains, end to end, and a powdery wax-like substance covers them. This method resembles the Coreidæ of the division Mictaria.

Some Coreinæ, e.g. *Homœocerus* and *Cletus*, deposit ova singly, and the Alydinæ, singly, or in twos and threes.

Various parts of the food-plant are chosen by the female insect when ovipositing, but usually the underside of the leaf in the case of those species which deposit ova in batches. Those which deposit their ova in chains, select the stems of the host, while those that deposit them singly or in small groups, do not seem to have a preference for any particular part of the plant.

The figures of egg-bursters (20—42) will be found on page 525.

Family PENTATOMIDÆ.

Subfamily PLATASPIDINÆ.

Brachyplatys subæneus Westw. (Fig. 20).

Egg-burster. (Fig. 20) T.-shaped. Transverse arm broadly angulate.

Transverse and longitudinal arms laterally compressed.

Brachyplatys vahlii Fabr. (Figs, 1, 21).

Egg-burster (Fig. 21) T-shaped. Transverse arm slender, curving forwards. Longitudinal arm laterally compressed, widening near junction with transverse arm.

The arrangement of the ova (Fig. 1a) on deposition seems to be characteristic of this sub-family. They are placed alternately in two rows with the bases contiguous, and the longer axes forming an angle of 45°.

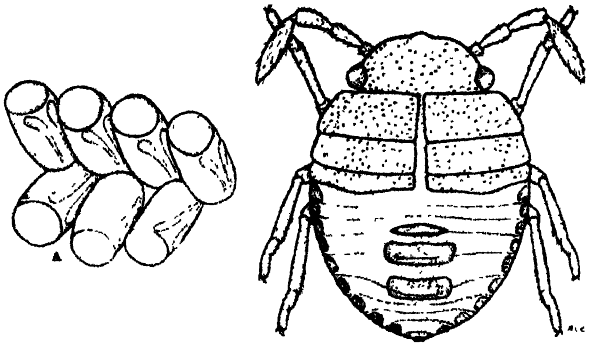


Fig. 1. *Brachyplatys vahlii* F.
A. Ova.
B. Larva, first instar.

They are cylindrical, rounded basally and feebly rounded and obliquely truncate at the opercular end. On the shorter side are two irregularly thickened carinæ, divergent towards the operculum. Surface finely punctate. Measurement. .8 x .3 mm.

In colour they are white with a faint iridescence.

First instar larva (Fig. 1b.). Antennæ olivaceous with the apical segment brown. Eyes dark red. Nota olivaceous, paler laterally. Abdomen dorsally pale olivaceous: segments 1 and 2 suffused with white laterally; remaining segments suffused with pale ferruginous; segments 4 and 5 with a white spot sub-dorsally; dorsal plates brown; connexival plates blackish olivaceous. Legs pale olivaceous.

Total length .9 mm.

Subfamily SCUTELLERINÆ.

Chrysocoris stockerus L. (Figs. 2, 3, 4, 5, 22).

Egg-burster (Fig. 22). Triangular, with the angles broadly rounded, and the sides feebly concave.

This is a moderately abundant species for which the food-plants, Castor *Ricinus communis* L. and Physic Nut *Jatropha curcas* L., have been recorded. When feeding on the last mentioned plant, it has been observed to suck the leaf stalks and the ripe nuts which it is able to reach after the husk has burst.

On the day of oviposition, the ovum (Fig. 2a) is pale green, and on the day following, irregular linear reddish markings appear. The position of these markings varies in each ovum.

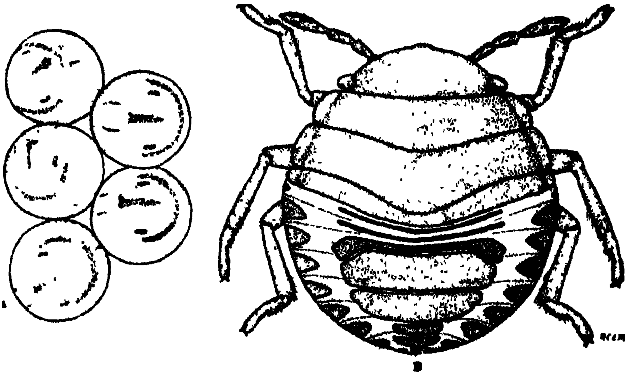


Fig. 2. *Chrysocoris stockerus* L.
A. Ova.
B. Larva, first instar.

Faint indications of the developing embryo are visible through the chorion on the third day, and the reddish markings increase in size and tend to coalesce. On the fourth day, the day of eclosion, the egg-burster becomes visible.

In shape the ova are spherical, and the surface smooth and shining. Around the operculum are a number of short processes arranged in an irregular manner.

The female deposits the ova on the under surface of a leaf.

First instar larva (Fig. 2b.). Ovate, convex dorsally. The dorsal plates on segments 1 and 2 are narrow and elongate; on segment 3 narrow and elongate and widening out laterally with the lateral margin sinuate. On segment 4 the plate is trapeziform with the angles rounded. On segments 5 and 6 the plates appear to have coalesced. On segments 7 to 9 the plates are oblong with the angles rounded.

Nota narrowly dorso-ventrally compressed laterally.

Rostrum extending beyond the posterior coxæ.

Eyes red. Legs and antennæ dark piceous. Head and nota piceous. Abdomen dorsally ochreous, ventrally darker with a quadrate piceous spot mid-ventrally on segments 5 to 9.

Dorsal and connexival plates piceous.

Total length 1.30 mm.

Second instar larva (Fig. 3). Ovate, strongly convex dorsally. Dorsal plates similar to those of the first instar larva. Rostrum extending to the base of the abdomen.

Eyes dark red. Antennæ piceous, narrowly vinaceous at base and apex of segments 1 to 3 and at the base of segment 4.

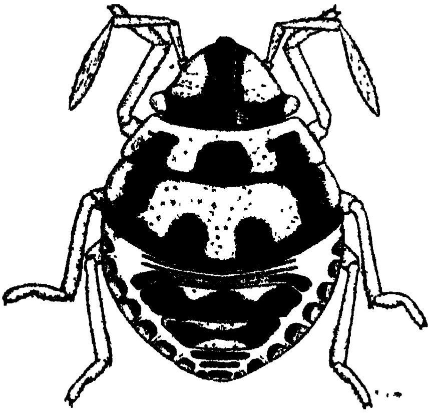


Fig. 3. *Chrysocoris stockerus* L. Larva, second instar.

Head dorsally black; juga metallic green. Pro and meso nota metallic bluish green; pronotum with a black spot on mid-dorsum and on the posterior margin laterally; mesonotum with a black spot on each side of the mid-dorsum and a black spot laterally; metanotum black.

Abdomen dorsally reddish ochreous; dorsal plates metallic bluish green with black suffusion; connexival plates dark metallic green.

Legs black with a metallic green lustre.

Pleura and ventral surface of head black. Sternites and abdomen ventrally reddish ochreous; segments 5 to 9 of the abdomen ventrally with a median quadrate black spot.

Total length 2.40 mm.

Third instar larva. Similar in shape to larva of first instar, but the rostrum barely extends to the base of the abdomen.

Antennæ, tylus and vertex piceous; juga metallic green.

Pro and meso nota metallic green; pronotum with three ovate black spots along posterior margin; mesonotum with a black spot laterally and a black spot on each side of mid-dorsum; metanotum black.

Abdomen reddish ochreous; dorsal plates metallic green, the plate on segment 3 black laterally, on segment 4 with three confluent black spots, and on segment 5 with an irregular transverse black stripe; connexival plates metallic green. Legs black with a metallic green lustre. Pleura dark metallic green. Total length 4.00 mm.

Fourth instar larva (Fig. 4). In this instar the rudiments of the hemielytra appear. The rostrum reaches the posterior margin of the 5th abdominal segment.

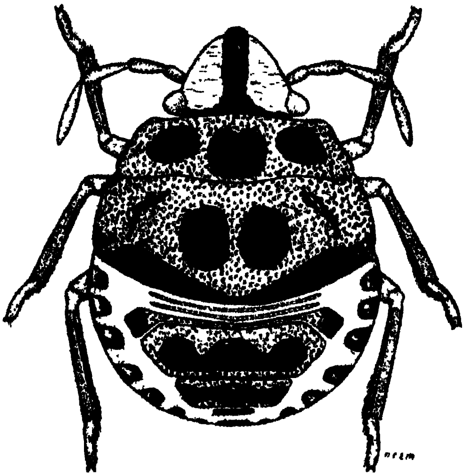


Fig. 4. *Chrysocoris stockerus* L. Larva, fourth instar.

Eyes dark red. Antennæ dark piceous. Tylus and vertex black; juga metallic green.

Pronotum metallic bluish green with the lateral margins narrowly black, and with a cordate black spot mid-dorsally and a quadrate black spot sub-dorsally; mesonotum metallic bluish green with the lateral margins narrowly black, and with a circular black spot on each side of mid-dorsum, and a large black spot sub-laterally on anterior margin; metanotum black.

Dorsal plates, except those on segments 1 and 2, which are brown, metallic bluish green; plate on segment 3 with a large black spot laterally; plates on segments 4 and 5 and 6 with three confluent black spots. Connexival plates black with metallic bluish green lustre.

Abdomen dorsally and ventrally reddish ochreous, with a brown quadrate spot mid-ventrally on segments 5—8.

Legs and pleura black with metallic green lustre.

Total length 5.50 mm.

Fifth instar larva (Fig. 5). In this instar the dorsal plate on segment 8 is fused with the connexival plate of the same segment, and degeneration of the dorsal plates on segments 1 and 2 takes place, the plates being indicated by a feebly sclerotised and punctate area.

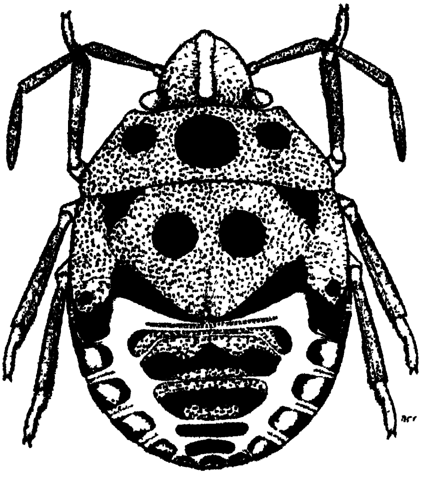


Fig. 5. *Chrysocoris stockerus* L. Larva, fifth instar.

The rudimentary hemelytra reach almost to the posterior margin of segment 3 of the abdomen. The rostrum reaches the posterior margin of the 5th abdominal segment.

Total length 8.50 mm.

In all instars two trichobothria are present on abdominal segments 3—7 close to the spiracle.

The adult immediately after moulting is entirely red, except for the femora, sternum and mid-ventrum which are luteous. The femora are slightly suffused with red, apically. After an hour or so the adult attains its full colour.

Individuals reared under laboratory conditions yielded the following data as regards the life cycle, incubation period 4 days; period of 1st instar 5 days; 2nd instar 6–7 days; 3rd instar 4–5 days; 4th instar 2–4 days; 5th instar 7-8 days.

Subfamily PENTATOMINÆ.

Antestia anchora Thunbg. (Fig. 6).

Ovum (Fig. 6) sub-spherical slightly flattened basally. Surface irregularly punctate reticulate and covered with short spines.

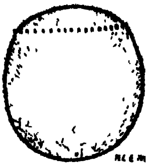


Fig. 6. *Antestia anchora* Thunb. Ovum.

The ova are deposited in batches.

Shortly after deposition the ova are pale brownish ochreous, with white opercular processes.

Antestia degenera Walk. (Fig. 23).

Egg-burster, (Fig. 23) T-shaped with the transverse arm sinuate, with the inner surface sulcate.

Eurydema pulchrum Westw. (Fig. 27).

Egg-burster (Fig. 27) anchor shaped with the inner margin of the transverse arm expanded forming an arcuate area between the extremities.

Cinxia limbata Fabr. (Figs. 7, 8, 25).

Egg-burster (Fig. 25) T-shaped with the transverse arm feebly arcuate.

Ovum (Fig. 7a) white with irregular markings. Sub-spherical with short capitate processes around the operculum; surface irregularly reticulate.

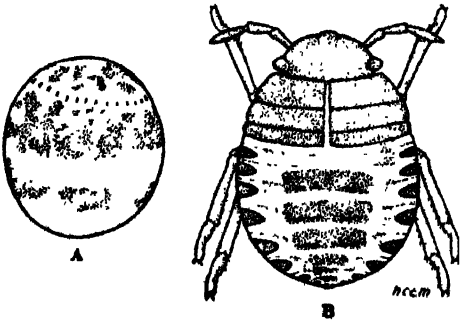


Fig. 7. *Cinxia limbata* F.
A. Ovum.
B. Larva, first instar.

First instar larva (Fig. 7b). Antennæ dark infumate with the base and apex of segments 1–3 and base of segment 4 narrowly vinaceous. Eyes red. Head, nota dorsal and connexival plates dark piceous.

Abdomen whitish with a longitudinal ochreous suffusion sub-dorsally.

Legs translucent pale infumate.

On eclosion the larva is ovate and dorsally convex. The connexival plates are triangular with the inner angle rounded. There is apparently no connexival plate on the 1st segment.

The dorsal plates on segments 3–5 of the abdomen are very broad and on segments 6–9 there are indications only of dorsal plates.

The larvæ remain in groups on the empty ova after eclosion.

Total length 2.00 mm.

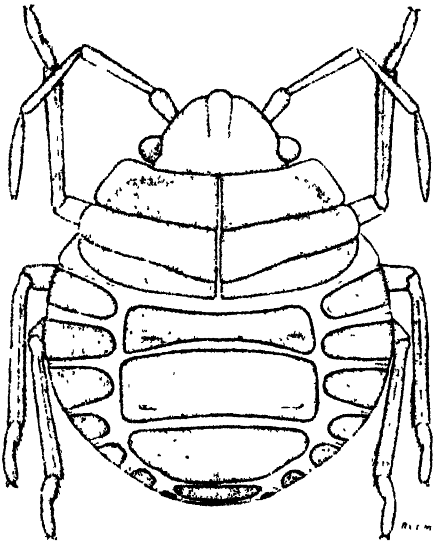


Fig. 8. *Cinxia limbata* F. Larva, second instar.

Second instar larva (Fig. 8). The larva in this instar is similar in colouration to the larva of the previous instar, except that the nota are narrowly whitish laterally and the abdomen is ochreous. The anterior margin of the pronotum is narrowly whitish and the abdomen has a narrow whitish spot mid-dorsally, on segment 1, and has segment 9 entirely black. The dorsal plates on segments 5 and 6 appear to be fused together.

Total length 3.00 mm.

Under laboratory conditions the incubation period was 6 days and the period of the 1st instar 4 days.

Nezara viridula L. (Fig. 26).

Egg-burster (Fig. 26) T-shaped with the transverse arm feebly arcuate.

Piezodorus rubrofasciatus Fab. (Fig. 24).

Egg-burster (Fig. 24) T-shaped with the transverse arm directed backwards feebly.

Menida varipennis West. (Fig. 28).

Egg-burster (Fig. 28), anchor shaped with the transverse arm having anterior margin strongly sclerotised. Membrane between arms infumate.

Subfamily ASOPINÆ.

Andrallus spinidens Fab. (Figs. 9, 10, 29).

Egg-burster (Fig. 29), T-shaped with the anterior margin of the transverse arm and the margins of the longitudinal arm curving inwards.

The ova which are deposited in batches are cylindrical, broadly rounded at each end, and have fourteen moderately long capitate processes around the rim of the operculum.

The surface is almost smooth or very finely reticulate.

On the sides are irregular black markings which seem to be composed of a substance of a protective nature or for sticking the eggs together.

Around the micropyle is a broad blackish ring.

Measurement 1.00 x .90 mm.

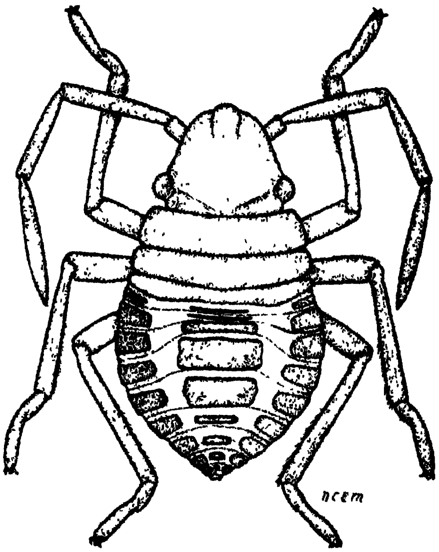


Fig. 9. *Andrallus spinidens* F. Larva, first instar.

First instar larva (Fig. 9). Elliptical, convex dorsally and ventrally. On segment 1 of the abdomen are three elongate sclerotised areas and dorsal plates are present on segments 3–8.

The rostrum reaches to the posterior coxæ.

Antennæ, head, thorax and abdominal plates dark piceous.

Abdomen dorsally and ventrally light red.

Total length 1.50 mm.

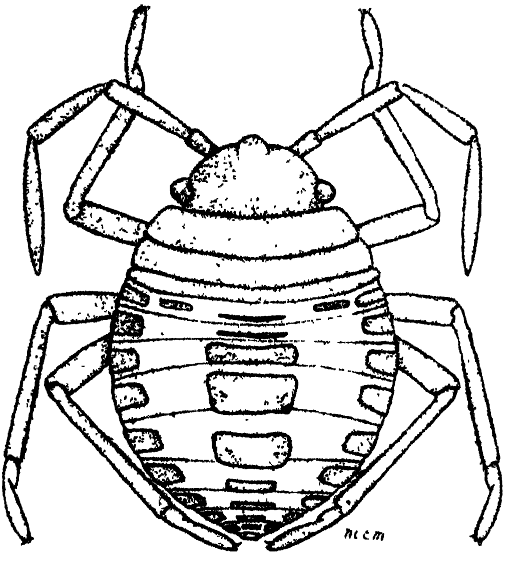


Fig. 10. *Andrallus spinidens* F. Larva, second instar.

Second instar larva (Fig. 10). Shining black except abdomen which is dark red, and somewhat infumate. The rostrum reaches beyond the posterior coxæ.

Total length 2.00 mm.

The adult has been found in tea plantations, where it is probably a predator of lepidopterous larvæ.

Subfamily TESSARATOMINÆ.

Eusthenes robustus Lepel. and Serv. (Figs. 11, 30).

Egg-burster (Fig. 30) with transverse arms at each end. Longitudinal arm with a strongly sclerotised ridge with a rounded projection at each end.

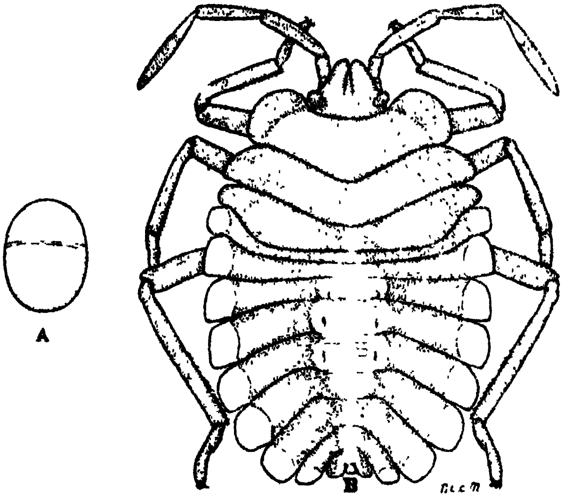


Fig. 11. *Eusthenes robustus* Lep. & Serv.
A. Ovum.
B. Larva, first instar.

Ovum (Fig. 11a) pale shining green with a narrow whitish equatorial stripe which is not always equidistant from either pole.

In shape regularly ovate but slightly narrower at one end.

Two batches of ova 6 in one and 16 in the other—were deposited in groups on the undersides of leaves by a female captured in the jungle, on a species of *Ficus*.

One larva emerged fourteen days after deposition of the ova, followed by five more, seventeen days after deposition. The remainder of the ova appeared to be infertile.

The larvæ were supplied with young shoots and leaves of a *Ficus*, on which they fed, but only occasionally. They did not thrive in captivity, dying after about ten days. When disturbed they emitted a considerable quantity of pungent fluid.

First instar larva (Fig. 11b). Pale green, translucent with narrow reddish margins. Dorsum with two longitudinal reddish stripes from vertex to apex of abdomen.

Legs reddish. Apical segment of antennæ black in apical half, white in basal half. Remaining segments reddish.

Total length 9.00 mm.

Mattiphus laticollis Westw. (Fig. 12).

Fifth instar larva (Fig. 12). One larva of this instar and two adults were captured at Ginting Simpak, Selangor, F.M.S. on the 22nd February, 1931. They were supplied with a species of *Mallotus* on which they fed readily, but did not survive for long, the adults dying without ovipositing.

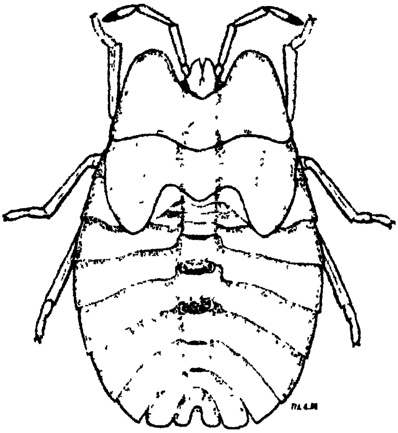


Fig. 12. *Mattiphus laticollis* Westw. Larva, fifth instar.

The larva is pale green, with whitish antennæ, of which segment 4 is black in the apical half. An irregular subparallel red stripe runs from the anterior part of the head, along the mid-dorsum to the apex of the abdomen.

The anterior and lateral margins of the pronotum and the anterior and lateral margins of the abdominal segments red, the red area on the anterior margin reaching to the sub-dorsal red stripe.

Tylus suffused with red and the exterior margins of juga narrowly black.

Pronotum with a faint median suffused spot subdorsally at the posterior margin. Rudimentary hemielytra with a diagonal red stripe.

Legs pale green; tibiæ with a narrow red longitudinal stripe on lower surface.

Dorsal plates pale green. Sternites with red spots and suffusion on anterior margin. External margins of all segments narrowly black.

Broadly ovate in shape, dorsally ventrally compressed, and with the anterior margin of the pronotum produced forwards.

Exterior margins of nota and abdomen finely serrate. Segments 2 and 3 of antennæ ovate in cross section with short setæ along the margins.

Dorsal plates on segments 3–5 and indications of dorsal plates on segments 6–8.

Total length 25.00 mm.

The adults when handled secrete an exceptionally large quantity of fluid having a strong smell of almonds, which stains deeply, the stain remaining for several days.

Pycanum rubens Fabr. (Figs. 13, 31).

Egg-burster (Fig. 31) with transverse arms at each end of longitudinal arm, the longer being broader apically than basally. The shorter arms are directed backwards. Margins of longitudinal arm more thickened and with an incision opposite the end on which the chorion piercer is situated.

This species deposits its ova in an irregular mass, and immediately after depositing them it covers them with a thin and almost colourless glutinous substance.

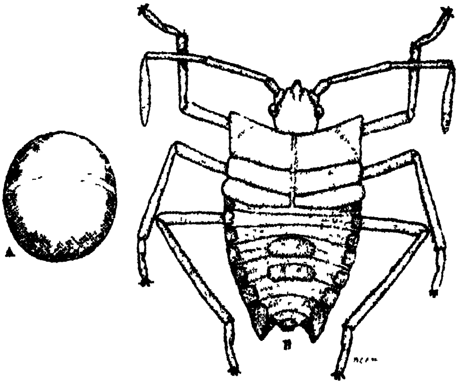


Fig. 13. *Pycanum rubens* F.
A. Ovum.
B. Larva, first instar.

The ovum (Fig. 13a) is pale green with a whitish green equatorial stripe. Sub-spherical and somewhat flattened at the operculum. Surface smooth, shiny and finely reticulate.

A female was captured at Bukit Kutu, Selangor, F.M.S. and brought to Kuala Lumpur where she deposited a batch of ten ova on the 23rd of March 1932. On the 7th of April the embryo became visible through the chorion, the eyes being indicated by small red crescentic spots.

On the 9th of April a circular air space appeared at the side of each ovum, and at the same time, it was possible to discern the shape of the egg-burster. Two days later, the legs and antennæ were plainly visible, and at the base of the latter a brownish fluid was present.

On the 12th of April four larvæ hatched before 8 a.m., and it was not until twenty-four hours later that more larvæ broke through the chorion, and three hours after another two hatched. The remainder failed to hatch.

Immediately after leaving the ovum, the larva (Fig. 13b) is uniformly light red, and an hour afterwards the antennæ, the lateral margins of the nota and the connexivum become purplish. The sternites and abdomen mid-ventrally are dull ochreous.

The measurement of the ovum is 4.0 x 4.3 mm. and of the larva one hour after eclosion 6.5 mm.

The young larvæ are gregarious while in the first instar, and, as far as one could ascertain, did not feed.

It is difficult to explain why some of the ova failed to hatch, and would not appear to be due to a change of temperature since this species is also to be found at low altitudes.

The time taken for eclosion was about fifteen minutes.

Pycanum ponderosum Stal. (Fig. 32).

Egg-burster (Fig. 32) T-shaped, with the transverse arms widening somewhat near the longitudinal arm. At the centre of the transverse arm is a sub-acute projection and the longitudinal arm has a strong ridge along it, and a strongly sclerotised sub-acute projection near the base. The longitudinal arm widens towards the transverse arms.

Subfamily DINIDORINÆ.

Megymenum brevicorne Fabr. (Fig. 33).

Egg-burster (Fig. 33) anchor shaped with an irregular triangular expansion at the end opposite the arcuate transverse arm.

Subfamily PHYLLOCEPHALINÆ.

Tetroda histeroides Fabr. (Fig. 34).

Egg-burster (Fig. 34) anchor shaped with the anterior margin of the transverse arm expanded and bent back feebly. Between the external half of the transverse arm and the basal half of the longitudinal arm is an area which is more highly sclerotised than the surrounding membrane.

Family COREIDÆ.

Subfamily COREINÆ.

Mictis tenebrosa Fabr. (Figs. 14, 15).

Ovum (Fig. 14a) cylindrical, feebly narrowed towards each end, flattened on side which is in contact with the surface on which deposited, and feebly obliquely truncate at each end; the micropylar end feebly concave and the opposite end feebly convex.

Colour dark shining bronze.

The ova are deposited in a chain end to end and are lightly covered with a wax-like powder.

Measurement 2.60 mm. x 1.80 mm.

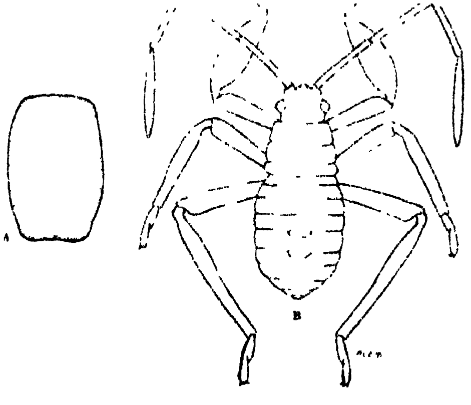


Fig. 14. *Mictis tenebrosa* F.
A. Ovum.
B. Larva, first instar.

First instar larva (Fig. 14b). Antennæ and legs dark brown. Eyes red. Head and nota dark brown; epicranial suture light brown. Nota with a median longitudinal light brown stripe. This is where the integument splits on ecdysis.

Abdomen light brown dorsally with rows of whitish spots which start from the anterior and posterior angles of the segments and converge towards the mid-dorsum; ventral surface light brown; dorsal plates reddish brown.

Elliptical. The anterior tibiæ are compressed and dilated and are about twice as broad at their widest part as the anterior femora.

Total length 4.00 mm.

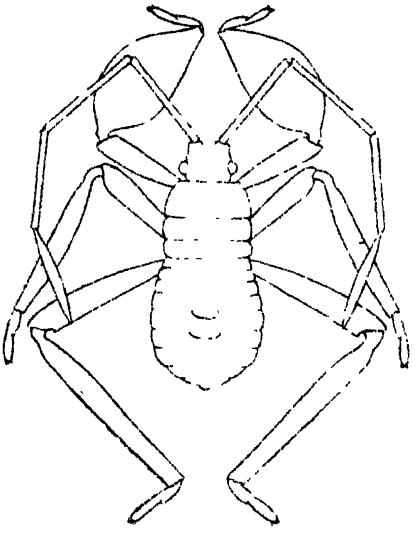


Fig. 15. *Mictis tenebrosa* F. Larva, second instar.

Second instar larva (Fig. 15). This is similar in colour and shape to the 1st instar larva, with the exceptions that the anterior tibiæ are more strongly dilated and are about three times as wide as the anterior femora, and the posterior femora have a short rounded spine on the lower margin near the apex. The spots on the dorsum of the abdomen are irregular.

Total length 4.30 mm.

Anoplocnemis phasiana Fabr. (Fig. 35).

Egg-burster (Fig. 35) an obtuse angulate rod, which is broader and more strongly sclerotised at the middle.

Homoeocerus albiguttulus Westw. (Figs. 16, 17, 36).

Egg-burster (Fig. 36) a narrow, arcuate sclerotised rod, more strongly sclerotised at the middle; the membrane immediately surrounding it is more highly sclerotised than the remainder of the membrane, and forms an area which is rhomboidal in shape.

When deposited the ova (Figs. 16a and b) are white and iridescent, but two days later they become pale ochreous. The ovum is ovate and flattened on one side, with the surface shining and irregularly reticulate. Around the operculum is a narrow area free from reticulation. A somewhat shallow depression with a circular sulcus in the centre is present on the flattened side.

Measurement 2.30 x 1.50 mm.

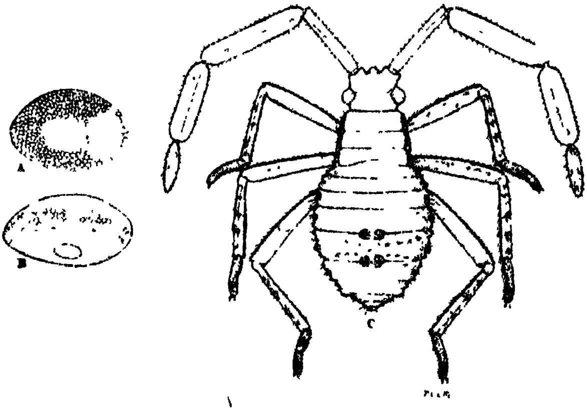


Fig. 16. *Homœocerus albiguttulus* Westw.
A. Ovum, from above.
B. Ovum, from side showing undersurface.
C. Larva, first instar.

First instar larva (Fig. 16c). General coloration greenish ochreous. Eyes red. Pleura olivaceous. Connexivum reddish ochreous with a brownish spot on external margin of segments; segment 4 of the abdomen with irregular transverse rows of ferruginous tubercles; segment 5 with a broad transverse ferruginous stripe; area around dorsal plates pale green; dorsal plates green suffused with black laterally.

Femora with irregular, low, ferruginous tubercles; tibiæ with irregular transverse ferruginous stripes; tarsi purplish.

In cross section the 1st antennal segment is triangular; segments 2 and 3 elongate ovate with a longitudinal carina on the upper surface and the lower surface concave; segment 4 fusiform.

Lateral margins of nota spinose. Surface of dorsal plates conical laterally. Entire larva moderately well covered with low tubercles.

Total length 3.40 mm.

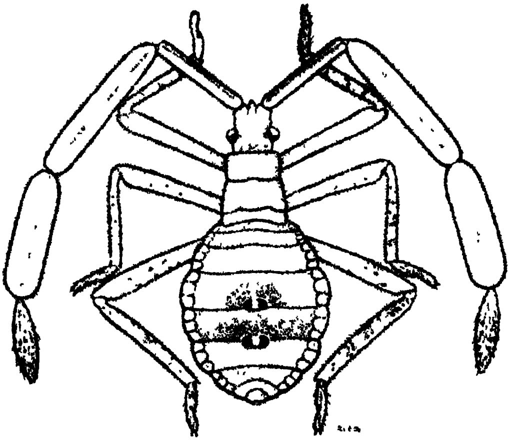


Fig. 17. *Homœocerus albiguttulus* Westw. Larva, second instar.

Second instar larva (Fig. 17). Pale green. Eyes brownish ochreous. Lateral margins of nota and dorsum of abdomen with an irregular ferruginous suffusion. Connexivum with an arcuate vinaceous spot on each segment and the external margins black.

Ventral surface of head with a longitudinal vinaceous stripe from base of rostrum. Setæ on antennæ and legs black. Setæ on external margin of connexivum light brown.

Similar in shape to the larva of the 1st instar except that the abdomen is more flattened dorso-ventrally and the connexivum is more defined.

Total length 5–6.00 mm.

Homoeocerus serrifer Westw. (Figs. 18, 37).

Egg-burster (Fig. 37) an arcuate sclerotised rod, more thickened at the middle.

Ovum, (Fig. 18a and b) ovate narrowly rounded at end opposite operculum and flattened on one side. Surface smooth, shining and reticulate except for a smooth elongate area on the upper surface. Colour pale ochreous with a faint iridescence. Micropyles brown.

Measurement 1.3 x .8 mm.

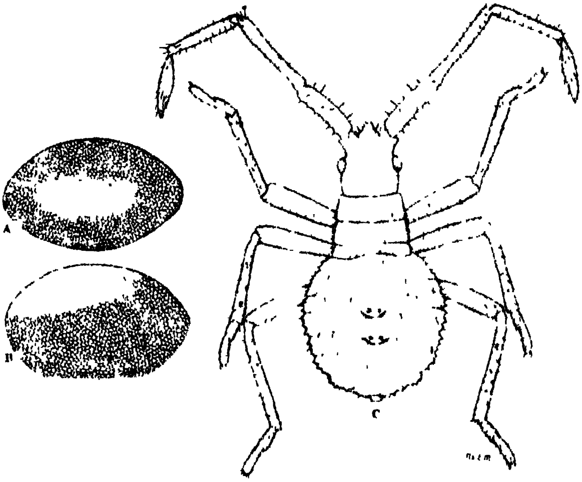


Fig. 18. *Homœocerus serrifer* Westw,

A, Ovum, from above.

B, Ovum, from side.

C, Larva, first instar,

First instar larva (Fig. 18c). Antennæ pale ochreous with brown tubercles on segments 1–3; segment 3 with a ferruginous suffusion basally. Eyes red. Head, body and legs whitish. Nota with an ochreous stripe laterally.

Segments 1–3 of the abdomen with an irregular ochreous stripe sub-dorsally; remaining segments with an irregular transverse ochreous suffusion.

Legs with light ferruginous tubercles, setæ whitish or pale ochreous. Ventral surface of body whitish.

The 1st antennal segment is triangular in cross section; segments 2 and 3 elongate ovate, flattened and feebly concave; segment 4 fusiform. The rostrum reaches just beyond the median coxæ.

Total length 2.20 mm.

Second instar larva. This is similar to the 1st instar larva, the colour, however, is somewhat greenish.

Total length 3.00 mm.

Physomerus grossipes Fabr. (Fig. 38).

Egg-burster, (Fig. 38), an arcuate rod, broader and more highly sclerotised at the middle. The membrane immediately surrounding it is more highly sclerotised than the remainder of the membrane.

Acanthocoris scabrator Fabr. (Fig. 39).

Egg-burster, (Fig. 39), a narrow arcuate rod with the middle irregularly and more highly sclerotised.

Cletus trigonus Thunbg. (Fig. 42).

Egg-burster, (Fig. 42), a trisinuate rod.

Subfamily ALYDINÆ.

Riptortus linearis Fabr. (Fig. 41).

Egg-burster, (Fig. 41), an arcuate rod with broad irregular rugose area at the middle.

Riptortus pedestris Fabr. (Fig. 40).

Egg-burster, (Fig. 40), similar to that of the last named.

Family LYGÆIDÆ.

Subfamily LYGÆINÆ.

Nysius inconspicuus Dist. (Fig. 19).

Ovum, (Fig. 19a) whitish. Cylindrical with a broad longitudinal sulcus on one side; strongly compressed basally; operculum surrounded by short processes.

Immediately before eclosion pale reddish ochreous with the darker markings of the embryo shewing through.

Measurement .7 mm.

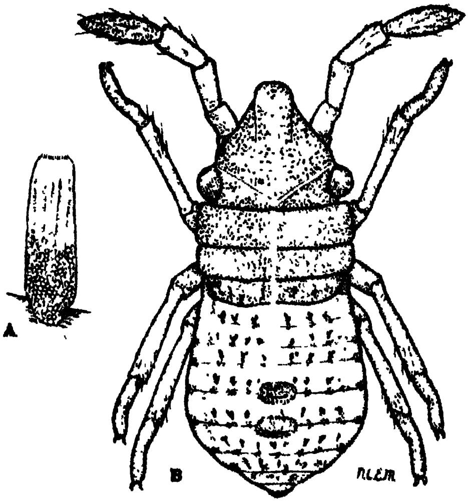


Fig. 19. *Nysius inconspicuus* Dist.
A. Ovum.
B. Larva, first instar.

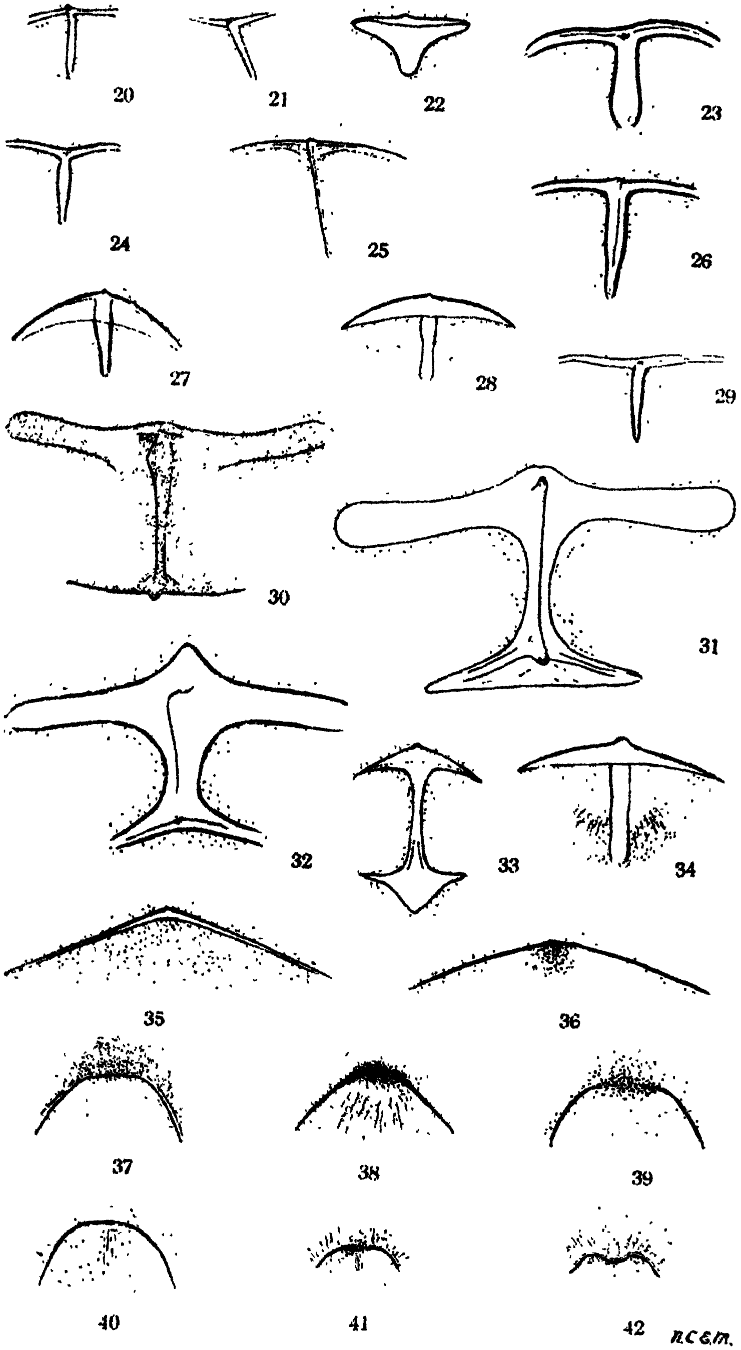
First instar larva (Fig. 19b). Pale reddish ochreous with darker reddish ochreous markings dorsally. Eyes red. The day after eclosion the head and body become greyish.

Total length .8 mm.

Nysius inconspicuus is a very active species in both larval and adult stages. Copulation between a pair kept in captivity was observed to occur six times in one day between the hours of 8.30 a.m. and 12.27 p.m. On the first occasion it lasted thirty minutes and on the other five occasions, one, four, eight, eight, and nine minutes. When about to make connection, the male sometimes throws the female on her back, but when the female regains a normal position the ultimate copulatory position is with the two insects facing in opposite directions. Copulation by the same pair was observed to occur on three consecutive days.

It is not known how many ova may be deposited by a single female, but an instance of the deposition of seventeen ova has been recorded.

An attempt to suck human blood by an adult which had temporarily escaped from the breeding cage took place once.



Figures 20 to 42. Egg-bursters of Rhynchota.

XXXIV. NOTES ON MALAYAN ACRIDIDÆ AND DESCRIPTIONS OF SOME NEW GENERA AND SPECIES.

By N. C. E. MILLER, F.R.E.S.

(With one plate and nine text figures).

The species dealt with in this paper were collected, mostly by the writer, in the Malay Peninsula, during the years 1928 to 1931, and the following genera and species are described herein as new: *Mitricephala rhodoptera* sp. n. (p. 531): *Lucretilis bolivari* sp. n. (p. 531); *Xenacanthippus miniatus* gen. et sp. n. (p. 534); *Willemsella bicolor* gen. et sp. n. (p. 536); *Anacrana nuda* gen. et sp. n. (p. 538); *Traulidea antennata* sp. n. (p. 540); *Utanacris pulchra* gen. et sp. n. (p. 542); *Utanacris flavifrons* sp. n. (p. 543); *Chorœdocus violaceipes* sp. n. (p. 544); *Pagdenia rufipes* gen. et sp. n. (p. 546).

Some notes on other species have also been added.

In view of the fact that the ecology of the Acridian fauna of the Malayan Region is imperfectly known, a useful purpose might be served by the provision of a list of the species favouring certain types of habitats. For this purpose I have classified the various types of localities in which I have collected under the following headings:

(1) Rice fields and grassland in vicinity. (2) Outskirts of jungle. (3) Interior of jungle, and (3*a*) jungle floor. (4) Open grassland formerly under cultivation. (5) Gardens and plantations.

Of these habitats, the only ones that can be considered as strictly natural are (3) and (3*a*): interior of jungle, and jungle floor, (which again could be designated as strata of the same habitat). The other types owe their existence largely to the agency of man.

As opportunities for systematic collecting, and for making detailed surveys of the Acridian fauna have not occurred regularly, it is not necessary to emphasize that only the fringe of the subject has been touched.

(1). Ricefields and grassland in vicinity.

Acrida turrita, Phlœoba infumata, Heteropternis respondens, Atractomorpha psittacina, A. crenulata, Tagasta marginella, Oxya diminuta, O. intricata, O. sinensis, O. multidentata, Gesonia mundata, Eucoptacra cingulatipes, Epistaurus aberrans, Catantops humilis, Tuberofera cyanoptera, Valanga nigricornis, Patanga luteicornis.

(2). **Outskirts of jungle.**

** *Erianthus guttatus,* ** *Erucius dimidiatipes luteipes,* ** *E. apicalis, Phlœoba antennata, P. infumata, Trilophidia annulata, Tagasta marginella, Oxya diminuta* ** *Traulidea antennata,* ** *Traulia annandalei,* ** *T. azureipennis,* ** *T. brunneri,* ** *Tauchira polychroa, Catantops splendens, C. humilis, Valanga nigricornis.*

(3). **Interior of jungle.**

** *Erianthus guttatus,* ** *Erucius dimidiatipes luteipes,* ** *E. apicalis, Phlœoba antennata, P. infumata,* * *Mitricephala rhodoptera,* * *Lucretilis bolivari,* * *Xenacanthippus miniatus,* * *Willemsella bicolor,* * *Perakia striatipennis,* * *Anacranæ nuda,* ** *Traulideo antennata,* ** *Traulia annandalei,* ** *T. azureipennis,* ** *T. brunneri,* ** *Tauchira polychroa,* * *Utanacris pulchra,* * *Utanacris flavifrons.*

(3*a*). **Jungle floor.**

Systella rafflesii, Sedulia specularia.

(4). **Open grassland formerly under cultivation.**

Acrida turrita, Gonista bicolor, Aiolopus tamulus. Heteropternis respondens, Gastrimargus transversus, Choradocus violaceipes, Catantops splendens, C. humilis, Valanga nigricornis.

(5). **Gardens and plantations.**

Pternoscirta caliginosa, Trilophidia annulata, Catantops splendens, C. humilis, Valanga nigricornis.

It will be observed from the foregoing list that certain species do not appear to be confined to any one type of habitat, but that those species marked *, found in jungle, are presumably restricted to that type of environment.

Those species (marked **) that occur both in the interior and on the outskirts of jungle, but not elsewhere, when found in the jungle are confined to the parts where the vegetation is less dense.

Species which appear to be more or less ubiquitous are *Valanga nigricornis, Acrida turrita,* and *Catantops humilis.* They have not been found in the jungle itself, but they occur occasionally in comparatively small, isolated, cultivated or otherwise cleared areas surrounded by jungle, such as on hill stations.

The species of *Oxya* are usually confined to ricefields and grassland at sea level and at comparatively low elevations. It will be noticed, however, that *Oxya diminuta*, a brachypterous species, occurs also at Fraser's Hill at an altitude of about 4,000 feet, and appears to have established itself there. The presence of this species in such a remote district of the jungle is somewhat puzzling unless it has been introduced in fodder grass, or soil; or possibly migration from lower elevations has taken place along the grass-grown roadsides leading up to the hill-station, as it is unable to fly, and is not likely to have traversed the extensive areas of dense forest which clothe the hillsides.

Under the habitat jungle floor are recorded *Systella rafflesii* and *Sedularia specularia*, for on each occasion they have been captured, they were found crawling or hopping on the carpet of dead leaves on the ground. Both species are occasionally found, however, on the leaves of low plants.

The attraction to artificial light of Acrididæ, apart from certain Tetriginæ, which are not dealt with in this paper, has not been observed by me on many occasions. Three species however, *Erianthus guttatus*, *Pternoscirta caliginosa*, and *Aiolopus tamulus*, have come to my notice as having been so attracted.

My sincere thanks are due to Dr. B. P. Uvarov, of the Imperial Institute of Entomology, for his ever willing assistance and advice during the preparation of this paper; to Dr. C. Willemse, Eygelshoven, Holland, for his kindness in examining all the new genera and species here described; to Professor Candido Bolivar y Pieltain, of the Museum of Natural Science, Madrid, for the determination of the Eumastacinæ and of *Lucretilis* sp., which I have pleasure in naming after him, and to my colleague Mr. H. T. Pagden of the Department of Agriculture, Straits Settlements and Federated Malay States, for collecting for me on many occasions. Specimens collected by him are indicated by (H.T.P.).

The types of all the new species here described have been deposited in the British Museum (Natural History).

The places in which the species under consideration were collected are:—

Selangor.

Ulu Langat, Batu Caves, Kuala Lumpur, Dusun Tua, The Gap, Bukit Kutu, Sungei Tua, Ulu Gombak, Kanching, Ginting Simpah, Serdang, Kuang.

Perak.

Tanjong Malim, Utan Melintang, Parit Buntar.

Pahang.

Fraser's Hill, Jerantut, Kuala Lipis, Ulu Cheka, Kampong Bahru.

Negri Sembilan.

Tampin.

Johore.

Paloh.

Kedah.

Kedah Peak, Alor Star, Gajah Mati.

Penang.

Balik Pulau.

Subfamily EUMASTACINÆ.

Chorotypus gallinaceus F.

Fraser's Hill. 1 larva.

Erianthus guttatus Westw. (Plate XIII, fig. 7).

Ulu Langat, Batu Caves, Kuala Lumpur, Jerantut, Kuala Lipis, Kedah Peak, (H.T.P.), taken at light at Kuala Lumpur.

Erucius dimidiatipes luteipes C. Bol.

Fraser's Hill, The Gap, Bukit Kutu.

Erucius apicalis Westw.

Ulu Langat, Dusun Tua, Ulu Cheka, Jerantut, Fraser's Hill.

Subfamily ACRIDINÆ.

Acrida turrita L.

Alor Star, Balik Pulau, Kuala Lumpur, Tampin, Kedah Peak, (H.T.P.).

Gonista bicolor Haan.

Tampin.

The colour of freshly killed examples is as follows:—

Pale grass green. Antennæ ferruginous suffused with pale grass green along the internal margin in the basal third. Eyes very pale green suffused with ferruginous and with some ferruginous stripes near the anterior margin. Sides of vertex and occiput suffused with ferruginous; face and margins of frontal ridge with some blackish spots. Pronotum with purplish or ferruginous suffusion above and below lateral carinæ, the lower suffusion very dark. Abdomen suffused with purplish-brown dorsally. Elytra with a purplish-brown suffusion along internal margin. Wings pale infumate with a narrow pale green suffusion along costa and a darker infumate suffusion along transverse nervules.

♀ Similar to ♂ but generally paler. Wings hyaline and very faintly infumate.

Phlœoba antennata B.v.W.

Dusun Tua, Ulu Langat, Sungei Tua, Ulu Gombak, Kanching, The Gap, Bukit Kutu, Gajah Mati, Fraser's Hill, Jerantut.

Phlœoba infumata B. v. W.

Tampin, Utan Melintang, Bukit Kutu, Tanjong Malim, Sungei Tua, Kampong Bharu, Ulu Gombak, Kuala Lumpur, Ginting Simpah.

Aiolopus tamulus F.

Serdang, Parit Buntar, (at light, H.T.P.), Fraser's Hill (H.T.P.), Kuala Lumpur, Jerantut.

Subfamily ŒDIPODINÆ.

Pternoscirta caliginosa Haan.

Tampin, Kuala Lumpur (at light) Ulu Gombak, Fraser's Hill, Bukit Kutu, Gajah Mati.

Heteropternis respondens Walk.

Ulu Langat, Sungei Tua.

Gastrimargus transversus Thunbg.

Kuala Lumpur, Kedah Peak (H.T.P.), Tampin, Sungei Tua.

Trilophidia annulata Thunbg.

Ulu Langat, Kedah Peak (H.T.P.).

Subfamily PYRGOMORPHINÆ.

Atractomorpha psittacina Haan.

Utan Melintang, Kuang, Alor Star.

Atractomorpha crenulata Fab.

Kedah Peak (H.T.P.), Kuala Lumpur, Kuang, Ulu Gombak, Kampong Bharu, Serdang, Paloh, Ulu Cheka.

Tagasta marginella Thunbg.

Tanjong Malim, Ulu Cheka.

Specimens differing in the shape of the fastigium of the vertex, and in their larger size from specimens taken in rice fields at sea level, were captured in jungle on Bukit Kutu at an elevation of about 2,000 ft. Since the material available for study is scanty, I have refrained from describing them as new.

Systella rafflesii Westw.

Fraser's Hill, Ulu Cheka.

Both green and brown colour varieties were taken.

Subfamily CATANTOPINÆ.

Mitricephala rhodoptera sp. n. (Plate XIII, fig. 11).

Dr. Willemse who kindly examined this species stated that it differs from all other known species in the red colour of the wings, the broader and somewhat shorter hind femora, the short fastigium of the vertex, the colour of the antennæ, and the shorter and broader pronotum. He compared it with *M. vittata* Bol.

Antennæ ensiform, with segments 3–9 moderately broad, triangular in cross section, with the upper surface rounded. Fastigium of vertex from above conical, rounded apically, with a deep median sulcus; surface punctate. Frontal ridge in profile almost straight, forming a rounded angle with fastigium: from the front, narrow, deeply sulcate between antennæ, thence, margins sub-obsolescent and punctate to clypeus. Surface of head smooth with scattered punctures; face and vertex more strongly punctate than rest of head. Pronotum regularly selliform; anterior and posterior margins of disc rounded, with a feeble median incision. 1st transverse sulcus indicated on lateral lobes only, 2nd and 3rd sulci distinct: surface of pronotum and pleura rugulose punctate. Elytra elongate ovate, coriaceous, and very closely reticulate, reaching to posterior margin of 6th abdominal segment. Supra-anal plate short, triangular with the apex rounded, and with median and lateral longitudinal depressions; sub-genital plate with the apical margin concave and with a median mucronate projection. Prosternal spine cuneiform with the apex feebly medially depressed. Posterior femora with the genicular lobes narrowly rounded apically.

General colouration olivaceous. Antennæ red with the base suffused with black. Eyes brown. Anterior and median tibiæ and tarsi and posterior tarsi brownish ochreous; posterior femora with the upper internal, part of the upper external and the lower internal faces reddish; internal face black: posterior tibiæ brownish olivaceous, with the internal face blackish violaceous. Wings light red with the external margin faintly infumate.

Total length	44.0 mm.
Pronotum	8.0 mm.
Elytra	19.0 mm.
Posterior femora	17.0 mm.

Described from 1 ♀, Kanching, Selangor, 4.3.30.

Lucretilis bolivari sp. n. (Fig. 1*a* & *b*. Plate XIII, fig. 3).

Moderately robust. Antennæ slender, filiform, reaching beyond the base of posterior femora. Vertex in profile rounded; fastigium from above broadly rounded apically, separated by moderately deep depression from the vertex; interocular distance slightly greater than width of frontal ridge between antennæ; eyes prominent, regularly ovate; frontal ridge in profile, straight irregular; from the front, margins parallel, irregular to median ocellus, thence obsolescent; surface of face and genæ rugose; sides of vertex deeply punctate, median and basal area smooth; fastigio-facial angle acute with the angle rounded.

Pronotum selliform, with the anterior and posterior margins of the disc rounded; anterior margins of lateral lobes rounded, posterior margins feebly concave, anterior half of lower margin feebly sinuate, posterior half straight, the margins forming an obtuse angle: surface of pronotum strongly rugose.

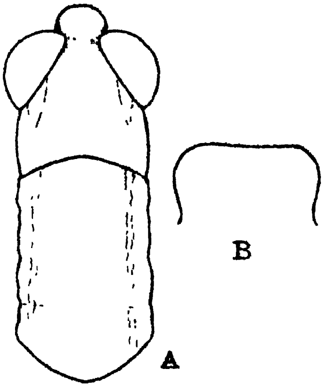


Fig. 1. Lucretilis bolivari sp. n.
A. Head and pronotum from above.
B. Prosternal spine.

Prosternal spine transverse, broad with the apex rounded.

Meso-sternal lobes with the inner margins rounded; meta-sternal lobes narrowly separated, with a deep depression on each side of interspace anteriorly.

Elytra elongate ovate, with the costal lobe moderately well developed, reaching to about the middle of the posterior femora.

Wings sub-equal to elytra in length.

Posterior femora with the carinæ dentate; oblique ridges irregularly thickened.

Posterior tibiæ slightly curved basally, with 8 spines including an apical spine on outer margin, and nine spines on inner margin.

Supra-anal plate long, triangular, laterally compressed, and with a deep sulcus in basal half.

Sub-genital plate with a median mucronate projection on the apical margin.

Antennæ blackish, red basally. Eyes light brown. Head reddish-brown with an ochreous spot behind the eyes, and an ochreous stripe from the base of the antennæ, thence along the genæ about the middle.

Disc of pronotum brownish olivaceous with the lateral margins ochreous; lateral lobes black with a transverse ochreous stripe in lower half, but not reaching the lower margin.

Pleura black with a large ochreous spot on each segment.

Sternites brownish ochreous.

Abdomen brownish ochreous with a sub-dorsal longitudinal pale ochreous stripe.

Anterior and median legs castaneous; posterior femora castaneous with the sides of knees and posterior half of genicular lobes black; posterior tibiæ black with the apex and a suffused area on outer surface basally, reddish brown; posterior tarsi reddish brown.

Elytra dark green with a faintly indicated median longitudinal reddish stripe in apical half.

Wings infumate.

Total length	30.0 mm.
Pronotum	7.0 mm
Elytra	11.0 mm
Posterior femora	16.0 mm.

Described from 1 ♀ (type). Fraser's Hill, Pahang, 4,000 ft. 2.4.29.

Genus **Xenacanthippus** gen. nov.

Apparently allied to *Xenippa* St. but no specimens of that genus are available for comparison. Differs from the description of *Xenippa* by all carinæ of the face being obsolete and by the peculiar armature of the hind tibiæ.

Moderate size, very slender. Antennal segments triangular in cross section in basal half, feebly dorso-ventrally compressed in remainder, considerably longer than head and pronotum together. Fastigium of vertex strongly produced in front, rather narrowly rounded apically, lateral margins sub-parallel; surface convex, rugose punctate. Eyes elongate with the anterior and posterior margins straight. In profile apex of head truncate with the lower margin rounded. All carinæ on face obsolete; surface rugose. Pronotum selliform, laterally compressed. Prosternal spine strongly laterally basally compressed, irregularly thickened anteriorly and posteriorly apically, and with apical surface irregularly depressed. Meso-sternal lobes longer than broad, inner margin obtuse angulate, contiguous in basal two-thirds; inner margin of meta-sternal lobes straight contiguous. Posterior femora reaching to 6th abdominal segment, slender; posterior tibiæ strongly setose, with 5 spines on internal margin and 26 spines on external margin. The spines on internal margin are very widely spaced, and on the external margin very closely spaced up to the 10th from the apex when the spacing is wider. Supra anal plate triangular with the apex rounded, the lateral margins sinuate and with a deep longitudinal sulcus throughout; sub-genital plate strongly produced, laterally compressed, (apex damaged in type specimen). Elytra narrow with the apex rounded; reaching almost to posterior margin of 4th abdominal segment.

Genotype, the following species.

Xenacanthippus miniatus sp. n. (Fig. 2, A-D).

In profile frontal ridge almost straight, sub-parallel to fastigium. Surface of pronotum and pleura rugose, anterior margin of pronotal disc feebly concave; posterior margin rounded; anterior margin of lateral lobes almost straight; posterior margin concave; lower margin sinuate. Abdomen rather densely setose ventrally. Anterior and median tarsi longer than tibiæ.

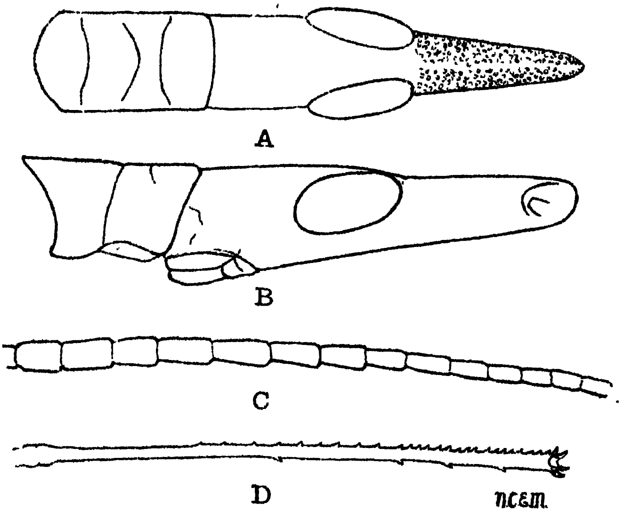


Fig. 2. *Xenacanthippus miniatus* gen. nov. et sp. n.
A. Head and pronotum from above.
B. Head and pronotum from side.
C. Antenna.
D. Posterior tibia.

Antennæ violaceous, darker in apical half, basal segment greenish ochreous, outer margin of whole antenna with a narrow ochreous stripe. Eyes purplish black with pale ochreous longitudinal stripes. Head greenish ochreous, with a narrow pale ochreous stripe along occiput and vertex; scrobes violaceous; fastigium suffused with dark violaceous; puncturation on each side of pale ochreous stripe on vertex, pale vinaceous; palpi bluish green. Pronotum greenish ochreous; median carina whitish ochreous; pleura and sterna greenish ochreous. Abdomen greenish ochreous, with apical segments bluish green; dorsum with pale ochreous stripe extending to apex of supra anal plate; sub-genital plate purplish grey. Femora greenish ochreous, becoming bluish green apically; tibiæ and tarsi bluish green; spines on posterior tibiæ whitish, broadly tipped with ferruginous. Outer area of elytra greenish ochreous, inner area blackish green, basal area whitish green. Wings reddish orange. (Colour description from freshly killed example).

Total length	40.0 mm. (approx.)
Pronotum	4.0 mm.
Elytra	14.0 mm.
Posterior femora	14.0 mm.

Described from 1 ♂ (type), Bukit Kutu, Selangor, 2,000 ft., 14.9.30.

Genus **Willemsella*** gen. nov.

Similar in appearance to *Racilia* but not actually related to it owing to the absence of external spine from posterior tibiæ and to shape of prosternal spine.

Fastigium of vertex from above ovate, sloping forwards feebly; surface rugose with a moderately deep transverse sulcus at base; margins feebly raised. In ♀ surface punctate and basal sulcus indistinct; in both sexes with a feeble median carina; fastigio-facial angle acute; frontal ridge in profile almost straight; from the front, margins sub-parallel, irregular; surface sulcate, rugulose; lateral facial carinæ arcuate in ♂, in ♀ arcuate to a point just below level of eyes, then straight. Pronotum selliform; in the ♀ feebly laterally compressed medially; prosternal spine slender, anteriorly posteriorly compressed; apex rounded. Inner margins of mesosternal lobes rounded; lobes slightly broader than mesosternal inter-space; inner margins of metasternal lobes broadly rounded, sub-contiguous. Elytra reaching to posterior margin of 6th. abdominal segment. Posterior femora exceeding apex of abdomen by about a quarter of their length. Posterior tibiæ with 8 spines on external, and 9 spines, including an apical one, on internal margin; external margin without an apical spine. Cerci ♂ and ♀ simple.

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* I have much pleasure in dedicating this new genus to Dr. C. Willemse of Eygelshoven, Holland, whose name is closely associated with the systematics of Malayan Acrididæ.

Genotype, the following species.

Willemsella bicolor sp. n. (Fig. 3, A-C; Pl. XIII, Figs. 8, 9).

Size moderate. Male little more than half the size of ♀. Antennæ in ♂ reaching beyond base of posterior femora; in ♀ about as long as head and pronotum together. Anterior and posterior margins of pronotum rounded; anterior and posterior margins, and posterior half of lower margin of lateral lobes straight, anterior half concave. Surface of face and lower area of genæ rugulose punctate: rest of head smooth with scattered punctures. Pronotum and pleura rugose; upper area of prozona of lateral lobes with smooth areas. Elytra rather narrow, with a moderately well developed costal lobe. Supra anal plate ♂ distorted in type; sub-genital plate ♂ broadly conical; supra anal plate ♀ rhomboidal, rounded apically, laterally compressed and with a basal depression; sub-genital plate ♀ quadrate with a median projection on apical margin.

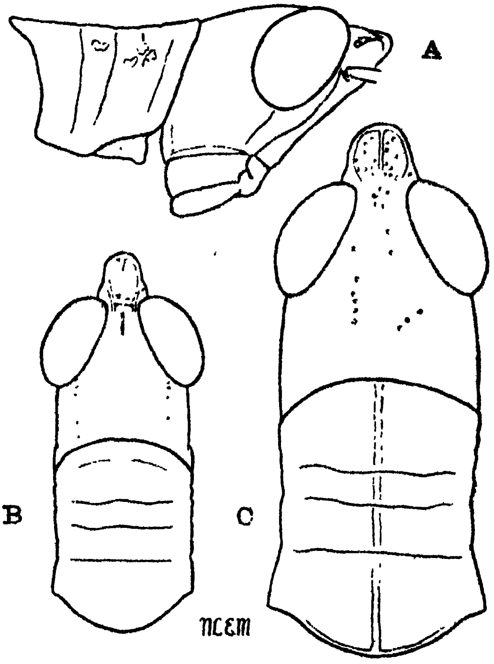

Fig. 3. *Willemsella bicolor* gen. nov. et sp. n.
A. Head and pronotum from side ♂.
B. „ „ „ „ above ♂.
C. „ „ „ „ „ ♀.

General colouration ♂ dark green. Antennæ with the two basal segments green, remainder red. Lateral lobes of pronotum with a broad pale ochreous stripe in lower half. Posterior femora with the knees black, an ochreous suffused spot at base of upper surface, and the lower internal and external faces suffused with red. Ventral and basal lateral surface of abdomen suffused with red. Posterior tibiæ blackish. Elytra green. Wings infumate.

General colouration of ♀ light brown. Antennæ reddish brown. Post-ocular area of genæ and upper half of lateral lobes and pleura dark brown; lower half of lateral lobes brownish ochreous. Abdomen brown, suffused with red ventrally basally. External face of posterior femora blackish; lower internal and external faces suffused with red; posterior tibiæ black. Area mediastina of elytra, dark brown.

	♂	♀
Total length	21.0 mm.	28.0 mm.
Pronotum	4.25 mm.	6.5 mm.
Elytra	10.0 mm.	11.5 mm.
Posterior femora	14.0 mm.	18.0 mm.

Described from 1 ♂ (type), and 1 ♀, *in cop.* Dusun Tua, Selangor, 10.11.29.

Perakia striatipennis Ramme. (Plate XIII, fig. 1). Kedah Peak, 3,000 ft. (H.T.P.).

Genus **Anacranæ** gen. nov.

Resembling *Cranæ* but not allied to it, and differing in the absence of the external apical spine from posterior tibiæ.

Medium size and moderately robust. Elytra and wings rudimentary. Antennæ filiform, in the ♂ reaching almost to posterior margin of 3rd. abdominal segment, considerably shorter in the ♀. Eyes large, prominent. Fastigium of vertex sloping forwards, forming almost a right angle with frontal ridge; truncate apically and with the lateral margins concave; moderately deeply impressed. Frontal ridge in profile straight, irregular; from the front, sulcate, margins sub-parallel between, constricted below antennæ, thence irregular. Lateral facial carinæ obsolescent. Surface of face rugose, remainder of head smooth with scattered punctures. Pronotum and pleura rugose; mesosternal episternum almost smooth. Prosternal spine short, conical, feebly anteriorly posteriorly compressed. Mesosternal lobes with the anterior margin straight and the remainder rounded; inner margins of metasternal lobes straight, contiguous. Elytra lateral in position, narrowly obliquely truncate, with the apical margin rounded; reaching to posterior margin of 1st. abdominal segment. Posterior femora reaching beyond apex of abdomen in ♂

and to apex of ovipositor valves in ♀ ; posterior tibiæ without an external apical spine. Lower ovipositor valves slender, cylindrical.

Genotype, the following species.

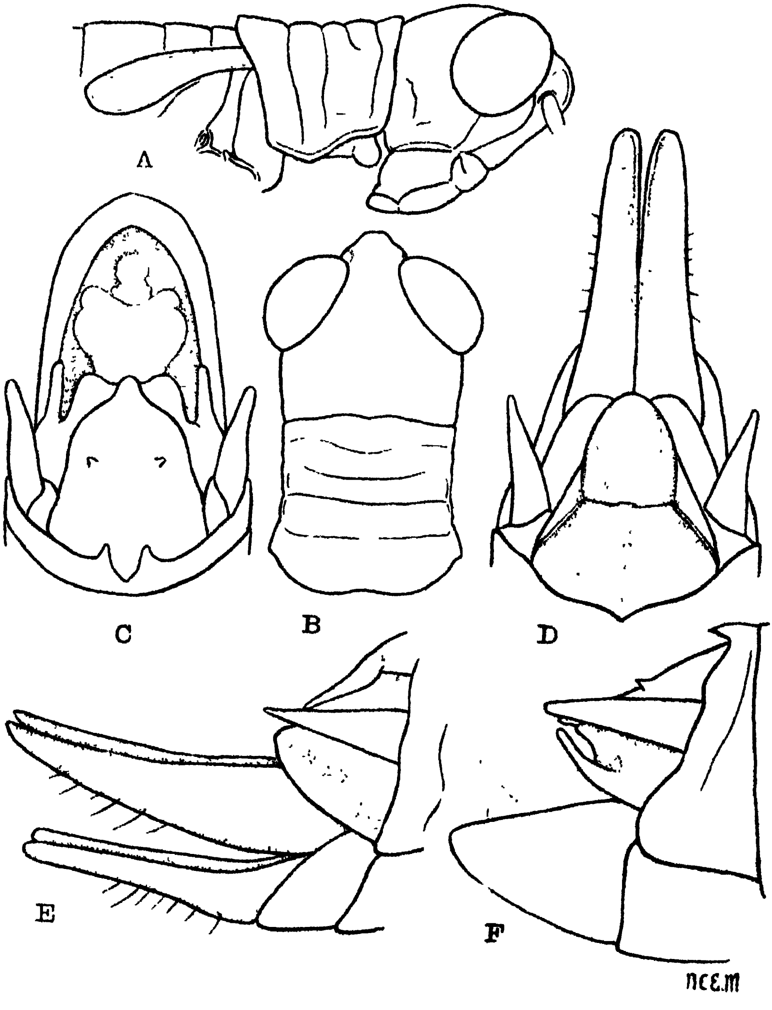

Fig. 4. *Anacrana nuda* gen. nov. et sp. n.
A. Head and pronotum from side ♂.
B. „ „ „ „ above ♂.
C. Apex of abdomen from above ♂.
D. „ „ „ „ „ ♀.
E. „ „ „ „ side ♀.
F. „ „ „ „ „ ♂.

Anacranæ nuda sp. n. (Fig. 4 A-F; Plate XIII, Fig. 10).

Pronotum selliform, strongly constricted by transverse sulci, the 1st. of which being indicated on the disc only; anterior margin of disc rounded with a median indentation;

posterior margin feebly concave; the indentation on the anterior margin is not so marked in the ♀. Abdominal segments 7 and 8 in the ♂, and 7 in the ♀ ventrally with two parallel rows of moderately long and dense setæ. Supra anal plate ♂, triangular, narrowly rounded and constricted apically, the sides feebly concave medially. dorso-ventrally compressed in apical half, with a median basal longitudinal depression and two low tubercles in base of apical half; sub-genital plate ♂, conical, obtuse; podical plate ♂ with a moderately slender process resembling a cercus on the middle of the lower margin. Cerci simple. Supra anal plate ♀ rhomboidal, rounded apically, dorso-ventrally compressed medially laterally, forming a triangular depression, and with three longitudinal depressions in basal half and a median longitudinal depression in apical half; sub-genital plate ♀ quadrate, with a median mucronate projection on apical margin. Upper ovipositor valves elongate, with the upper surface of the apical half flattened.

General coloration olivaceous or greenish ochreous. Antennæ blackish green. Eyes brown. Elytra dark brown with a narrow light brown area along inner margin. Posterior tibiæ green with black spines.

	♂	♀
Total length	23.0 mm.	30.0 mm.
Pronotum	4.0 mm.	6.0 mm.
Elytra	4.5 mm.	5.0 mm.
Posterior femora	14.0 mm.	17.0 mm.

Described from 1 ♂ (type), The Gap, 17.8.28 and 1 ♀, Ulu Langat District, 2.9.28.

Oxya diminuta Walk.

Kuang, Ulu Langat, Tampin, Sungei Tua, Utan Melintang, Fraser's Hill, (one specimen entirely brown).

Oxya intricata Serv.

Ulu Langat, Kuang, Kuala Lumpur, Tampin, Ulu Gombak, Kuala Lipis, Sungei Tua, Utan Melintang, Kampong Bharu, Tanjong Malim, Alor Star.

Oxya sinensis Thunbg.

Kuang, Gunong Semanggol, Alor Star.

Oxya multidentata Will.

Kuang, Utan Melintang, Sungei Tua.

Oxya sp n.?

Parit Buntar (H.T.P.).

One ♂ which appears to be new. The outstanding feature of this specimen is that it has the apex of the sub-genital plate bilobate.

Gesonia mundata Walk.
Sungei Tua.

Sedulia specularia St.
Bukit Kutu, Ulu Gombak, Tampin, Jerantut.

Traulidea antennata sp. n. (Fig. 5; Plate 13, fig. 2).

Differs from *Traulidea gracilis* Willemse., in the shape of the elytra which are narrower, shorter and more closely reticulate, and in having the sub-genital plate longer and obtuse apically. It differs in colour in having no reddish reticulation on elytra, the abdomen suffused with brown and not definitely striped with black dorsally, and the posterior femora reddish-brown. The description of the colour of the posterior femora of *Traulidea gracilis* by Willemse, (Fauna Sumatrensis, Bijdrag No. 62, Prelim. Revis. of the Acrididæ), does not agree with the type which is in the British Museum.

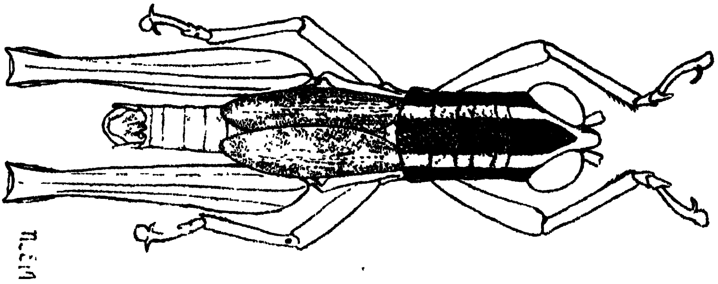

Fig. 5. *Traulidea antennata* sp. n. Whole insect from above.

Antennæ filiform, about as long as whole insect in ♂, and reaching to 5th abdominal segment in ♀. Surface of face and lower area of genæ rugose, remainder of head smooth, punctate. Surface of pronotum and pleura rugose. Anterior and posterior margins of disc rounded: anterior margin of lateral lobes feebly rounded; posterior margin almost straight; lower margin concave in anterior half, straight in posterior half. Supra anal plate ♂ triangular, rounded apically, with median and lateral basal depression; sub-genital plate ♂ conical, somewhat laterally compressed near apex; supra anal plate ♀ rhomboidal, rounded apically with an arcuate carina from the lateral basal angles across the middle, laterally compressed in apical half, and with a median basal depression; sub-genital plate ♀ quadrate with the apical margin obtuse angulate, and with a median mucronate projection.

Antennæ black, with the 3 apical segments pale ochreous.

Eyes dark brown. Head black with ochreous spots on clypeus and mandibles, an ochreous spot at base of frontal ridge, an ochreous stripe from the base of antennæ along lower margin of the eye to the middle of the posterior margin of genæ, and an ochreous stripe from the apex of fastigium of the vertex, then bifurcating along the inner margin of the eyes to base of head. Pronotum dark brown with an ochreous stripe laterally on disc and near lower margin of lateral lobes; pleura dark brown with a median horizontal ochreous stripe. Abdomen brownish ochreous with brown suffusion. Elytra dark brown, with a median ochreous stripe from base almost to apex. Wings infumate. Anterior and median legs and posterior femora reddish brown; knees on posterior femora black; posterior tibiæ olivaceous, blackish basally.

	♂	♀
Total length	17.0 mm.	23.0 mm.
Pronotum	4.0 mm.	5.0 mm.
Elytra	6.0 mm.	7.5 mm.
Posterior femora	11.0 mm.	13.0 mm.

Described from 1 ♂ (type), Fraser's Hill, Pahang, 4.10.29, 4,000 ft., 1 ♂ The Gap, 2,700 ft., 8.8.28; 3 ♂ s, Tanah Rata, Cameron Highlands, 4,000 ft., 17.3.30; 3 ♂ s, Fraser's Hill, 1-3-4.10.29; 2 ♀ s, Tanah Rata, 17.3.30 and 1 ♀, Bukit Kutu, Selangor, 3,457 ft., 14.9.30.

Although frequently found on other plants, this species seems to prefer *Rubus rosæfolius* Sm.

Traulia annandalei C. Bol.

Kedah Peak, 3,978 ft. (H.T.P.).

Traulia azureipennis Serv.

Bukit Kutu, Ulu Langat, Ulu Cheka, Kuang, Ulu Gombak.

Traulia brunneri I. Bol.

Ulu Cheka, Jerantut, Bukit Kutu, Ulu Langat.

Tauchira polychroa Stal.

Kedah Peak, (H.T.P.), Fraser's Hill, Jerantut, Bukit Kutu, Ulu Gombak, The Gap, Ulu Langat, Gajah Mati.

Genus **Utanacris** gen. nov.*

Allied to the Central American *Annicerus* St., but differs from it in the shape of the prosternal spine and the male genitalia.

Brachypterous. Antennæ filiform, reaching beyond the 7th abdominal segment. Eyes prominent. Head smooth with scattered punctures. Pronotum selliform, rugose. Fastigium of vertex sloping forwards. Prosternal spine transverse, with the apex feebly trilobate. Inner margins of mesosternal lobes rotundatoangulate, of metasternal lobes contiguous. Posterior femora reaching beyond the

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* The generic name given in this case, is derived from "utan," the Malay for jungle.

apex of the abdomen. Posterior tibiæ with few spines, and without an external apical spine. Tarsi long, the anterior and median ones almost as long as the tibiæ, and the posterior ones about half as long as the posterior tibiæ. Arolium strongly developed. Anterior and median tarsi moderately, posterior tarsi strongly setose. Ventral surface of abdominal segments 5–7 medially with strong tufts of setæ arranged in two parallel rows. Genotype, the following species.

Utanacris pulchra sp. n. (Fig. 6 A-C; Plate XIII, fig. 4).

Fastigium of vertex from above truncate apically with the lateral margins feebly concave; surface feebly ovately impressed. Fastigio-facial angle acute with the immediate angle rounded. Frontal ridge almost straight, irregular; from the front feebly laterally compressed and sulcate between antennæ, thence obliterate; lateral facial carinæ feebly arcuate. Inter-ocular distance slightly less than width of frontal ridge between antennæ. Surface of face rugose. Anterior and posterior margins of pronotal disc rounded, the anterior margin with a feeble median indentation; 1st transverse sulcus distinct on disc, 2nd and 3rd sulci on disc and lateral lobes; anterior margin of lateral lobes feebly rounded; posterior margin feebly concave; lower margin concave in anterior half, rounded in posterior half. Elytra cycloid, coriaceous and densely reticulate, not reaching posterior margin of 3rd abdominal segment. Supra anal plate triangular with the apex rounded, and with a median basal, and lateral longitudinal depressions; sub-genital plate conical obtuse. Cerci simple.

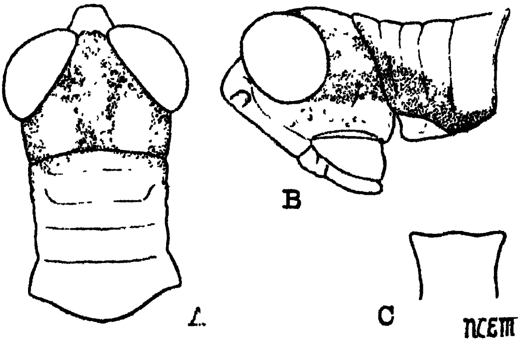

Fig. 6. *Utanacris pulchra* gen. nov. et sp. n.
A. Head and pronotum from above.
B. „ „ „ „ side.
C. Prosternal spine.

Antennæ light brown, greenish basally. Eyes brown. Head pale ochreous, with a broad post-ocular black stripe, and the vertex (between the eyes) and a broad stripe to the base of the head, black. Pronotum olivaceous with the lower area and anterior margin of lateral lobes black;

pleura black with the upper area of meso pleura ochreous. Abdomen greenish with the dorsum of segments 1–3 blackish. Elytra pale olivaceous with the apex and costal area black. Wings infumate. Anterior and median legs and posterior tarsi greenish ochreous, or olivaceous; posterior femora ochreous with the knees black and a sub-basal red, and a sub-apical green transverse fascia; posterior tibiæ greenish ochreous, black basally, spines black.

Total length	19.0 mm.
Elytra	6.5 mm.
Pronotum	4.0 mm.
Posterior femora	12.0 mm.

Described from 1 ♂ (type), Ulu Gombak, Selangor, 12 miles from Kuala Lumpur, 24.6.28.

Utanacris flavifrons sp. n. (Fig. 7 A-B; Plate XIII, fig. 6).

Fastigium of vertex from above sloping forwards, truncate apically; lateral margins almost straight; surface feebly ovately depressed. Fastigio-facial angle acute with the immediate angle rounded. Frontal ridge in profile straight and irregular. Lateral facial carinæ obsolescent. 1st transverse sulcus indicated on disc of pronotum only, 2nd and 3rd sulci strong on disc and lateral lobes. Anterior and posterior margins of disc rounded; anterior and posterior margins of lateral lobes almost straight; lower margin concave in anterior half, rounded in posterior half; surface of pronotum rugose, less so on prozona of disc. Elytra with the costal margin strongly rounded, coriaceous and densely reticulate. Supra anal plate triangular, feebly constricted laterally sub-apically, with the apex rounded and with longitudinal depressions; sub-genital plate conical, obtuse. Cerci simple.

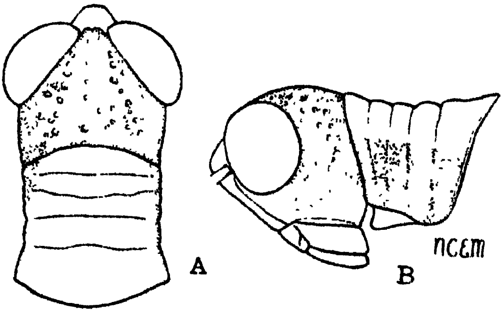

Fig. 7. *Utanacris flavifrons* gen. nov. et sp. n.
A. Head and pronotum from above.
B. „ „ „ „ side.

Antennæ with the two basal segments pale ochreous, remainder dark green, blackish green in apical half. Eyes brown. Face, fastigium of vertex, lower half of genæ, mandibles pale ochreous, upper half of genæ, vertex black; clypeus greenish. Disc of pronotum and upper area of metazona of lateral lobes green, remainder black; pleura, sternites, elytra black. Abdomen greenish with segments 1–4 dorsally black; ventral surface suffused with black. Anterior and median legs and posterior femora greenish ochreous; knees of posterior femora blackish green. Posterior tibiæ green, blackish green basally. Wings infumate.

Total length	17.0 mm.
Pronotum	3.5 mm.
Elytra	5.0 mm.
Posterior femora	11.0 mm.

Described from 1 ♂ (type). Fraser's Hill, Pahang, 4,000 ft., 3.4.31.

Choroedocus violaceipes sp. n. (Fig. 8 A-B).

Antennæ filiform, dorso-ventrally compressed basally, longer than head and pronotum together. Fastigium of vertex from above ovate, surface depressed and with a feeble median carina which continues to base of head; fastigio-facial angle rounded. Frontal ridge in profile feebly arcuate; from the front smooth, punctate; margins divergent feebly to median ocellus, constricted feebly at ocellus, thence more strongly divergent and becoming obsolete to clypeus; lateral facial carinæ regularly arcuate. Anterior and posterior margins of pronotal disc broadly rounded; median and lateral carinæ distinct; lateral carinæ obsolescent in metazona; surface of disc laterally and of lateral lobes rugose punctate; prosternal spine cylindrical, rounded apically and curving towards mesosternum. Supra-anal plate triangular, feebly concave, with the margins sinuate and strongly basally constricted; sub-genital plate conical, rounded apically. Cerci reaching beyond apex of abdomen, spatulate, surface feebly convex, compressed near apex.

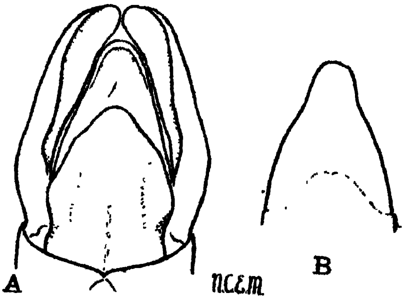

Fig. 8. *Choroedocus violaceipes* sp. n.
A. Apex of abdomen from above, ♂.
B. Sub-genital plate, ♂.

Sub-genital plate is not truncate as in *C. insignis* and is more narrow than in *C. illustris* and *C. robustus*, which it resembles in having immaculate elytra, but from which it differs in the sub-genital plate and colour of posterior tibiæ.

Antennæ pale brownish olivaceous. Eyes dark brown with a narrow pale ochreous stripe along anterior margin. Face pale brownish olivaceous; clypeus and labrum pale ochreous. Lateral margins of occiput, genæ and mandibles ochreous; anterior area of genæ with a broad brownish suffusion below the eyes, which continues along anterior margin of mandibles. Vertex and occiput with a longitudinal median greyish brown stripe. Disc of pronotum pale ochreous with a broad median longitudinal brown stripe; lateral carinæ brownish; lateral lobes and pleura greyish olivaceous; sternites and ventral surface of abdomen pale sulphur green; dorsum of abdomen pale greyish olivaceous. Anterior and median legs pale greyish olivaceous; posterior femora pale greyish olivaceous with the sides of the knees brown and with a pale violaceous suffusion on internal face; posterior tibiæ pale violaceous slightly suffused with brown basally; spines whitish with black tips; posterior tarsi brownish violaceous. Elytra brownish ochreous, with a pale ochreous suffusion along anterior margin of anal area and a brownish suffusion at humeral angle. Wings pale blue.

(Colour description from freshly killed specimens).

Total length	41.0 mm.
Pronotum	7.5 mm.
Elytra	34.0 mm.
Posterior femora	25.0 mm.

Described from 4 ♂s, nr. Tampin, Negri Sembilan, 25.6.30 and 20.8.30.

Eucoptacra cingulatipes Bol.

Ulu Langat, Kampong Bharu.

Genus **Pagdenia*** gen. nov.

A member of the group *Coptacræ;* not closely related to any known genus.

Medium size. Brachypterous. Antennæ longer than head and pronotum together, filiform, feebly dorso-ventrally compressed in basal two-thirds. Eyes regularly oval, prominent. Fastigium of vertex strongly sloping downwards. Frontal ridge projecting between antennæ, deeply sulcate above median ocellus. Inter-ocular distance slightly greater than width of frontal ridge between antennæ. Fastigium of vertex from above truncate apically, lateral

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* This genus is dedicated to Mr. H. T. Pagden.

margins concave. Temporal foveolæ well developed. Lateral facial carinæ distinct, feebly arcuate and irregular. Pronotum selliform; metazona of disc somewhat flattened; median carina irregular; 1st transverse sulcus not indicated on lateral lobes. Prosternal spine conical, rounded apically. Mesosternal lobes with the inner margins rounded; metasternal lobes with the inner margins sub-contiguous. Elytra reaching to the middle of 2nd abdominal segment. Upper carina of posterior femora serrate; posterior tibiæ with 7 spines on external, and 9 spines, including an apical spine on internal margin. Supra-anal plate triangular, with the margins thickened, a moderately deep median longitudinal basal depression; sub-genital plate obtusely rounded apically. Cerci reaching beyond apex of abdomen, laterally compressed, more strongly so apically, widened sub-apically and curving inwards.

Genotype, the following species.

Pagdenia rufipes sp. n. (Fig. 9 A-D; Plate XIII, fig. 5).

Surface of head, pronotum and pleura rugose. Anterior and median femora irregularly rugose and foveolate. Elytra somewhat produced and narrowly rounded apically; strongly coriaceous. Abdomen with a distinct dorsal carina.

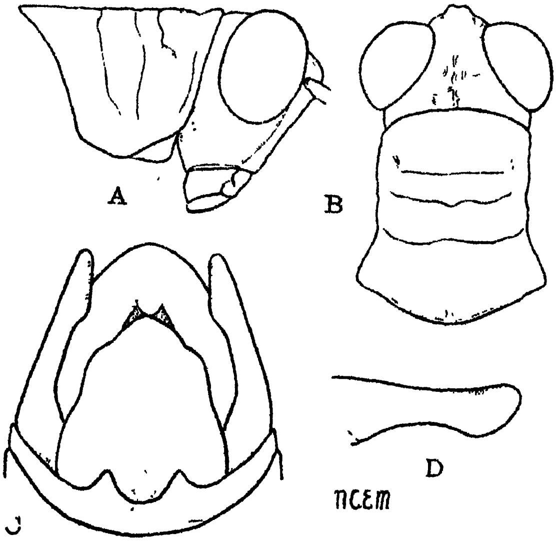


Fig. 9. *Pagdenia rufipes* gen. nov. et sp. n.
A. Head and pronotum from above.
B. „ „ „ „ side.
C. Apex of abdomen from above.
D. Cercus

Antennæ blackish with the apical half of the 2nd segment from the apex and the two apical segments pale ochreous. General coloration dark brown. Abdomen with the posterior margins of the segments dorsally light brown; ventrally light brown with dark brown suffusion and with the lateral margins dark brown. Anterior and median tarsi brownish olivaceous; anterior and median femora and tibiæ and posterior femora green; knees of posterior femora blackish; posterior tibiæ red, blackish basally and with a green pre-genicular band; spines tipped with black; posterior tarsi red.

Total length	18.0 mm.
Pronotum	5.0 mm.
Elytra	5.0 mm.
Posterior femora	10.5 mm.

Described from 1 ♂ (type), Kedah Peak, 3,600 ft., 19.4.30, H. T. Pagden.

Epistaurus aberrans B. v. W.

Kuang, Kampong Bharu.

Catantops splendens Thunbg.

Kuala Lipis, Bukit Kutu, Kedah Peak, (H.T.P.), Tampin.

Catantops humilis Serv.

Kuala Lipis, Batu Caves, Ulu Langat, Kedah Peak, (H.T.P.), Tampin, Kuang.

Tuberofera cyanoptera Will.

Ulu Cheka.

Description of ♂ genitalia: Supra-anal plate triangular, strongly deflected laterally, with an arcuate carina from the basal lateral angles across the middle, and with a median longitudinal depression in basal half, and a short sub-apical depression. Sub-genital plate quadrate with a median mucronate projection on apical margin. Upper ovipositor valves very feebly serrate on outer margin. Cerci simple.

Valanga nigricornis Burm.

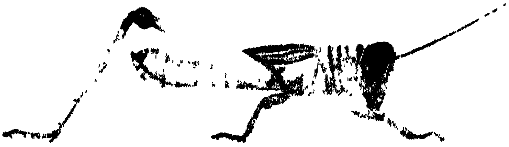
Bukit Kutu, Serdang, The Gap, Kuala Lumpur, Sungei Tua, Ulu Langat, Kedah Peak, (H.T.P.).

Patanga luteicornis Serv.

Alor Star, Parit Buntar (H.T.P.).

Explanation of Plate XIII.

Fig. 1. PERAKIA STRIATIPENNIS Ramme.
Fig. 2. TRAULIDEA ANTENNATA sp. n.
Fig. 3. LUCRETILIS BOLIVARI sp. n.
Fig. 4. UTANACRIS PULCHRA gen. nov. et sp. n.
Fig. 5. PAGDENIA RUFIPES gen. nov. et sp. n.
Fig. 6. UTANACRIS FLAVIFRONS sp. n.
Fig. 7. ERIANTHUS GUTTATUS Westw.
Fig. 8. WILLEMSELLA BICOLOR gen. nov. et sp. n. ♂
Fig. 9. WILLEMSELLA BICOLOR gen. nov. et sp. n. ♀
Fig. 10. ANACRANÆ NUDA gen. nov. et sp. n.
Fig. 11. MITRICEPHALA RHODOPTERA sp. n.



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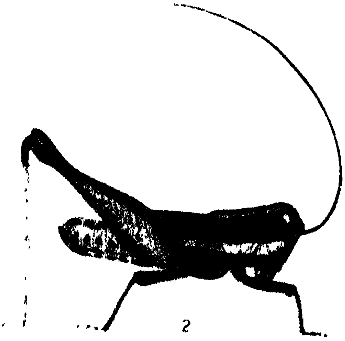

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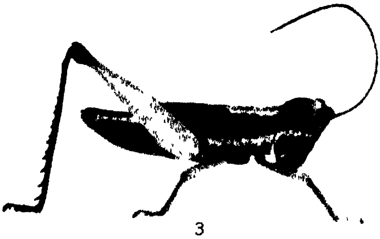

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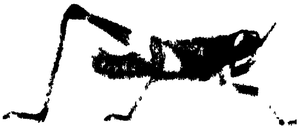

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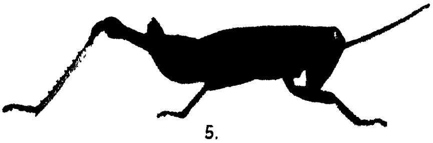

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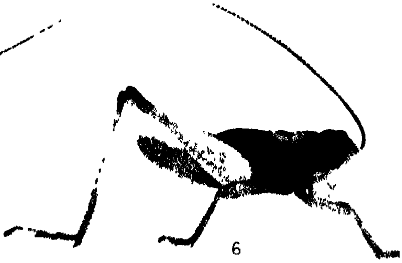

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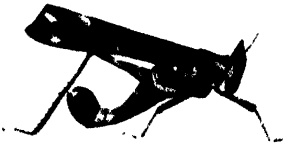

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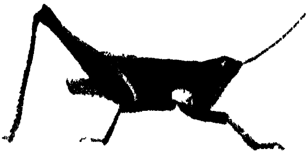

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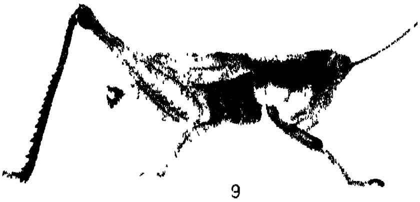

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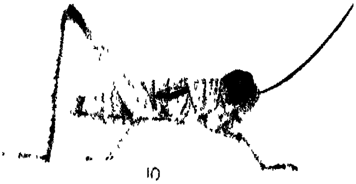

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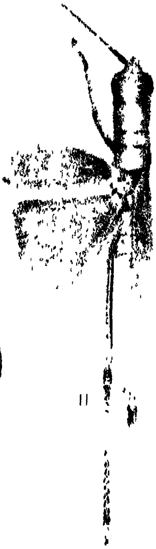

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XXXV. A NOTE OF THE DRAGONFLY FAUNA (ODONATA) OF MOUNT KINABALU AND OF SOME OTHER MOUNTAIN AREAS OF MALAYSIA:

WITH A DESCRIPTION OF SOME NEW OR LITTLE KNOWN SPECIES.

By F. F. LAIDLAW.

(With four text figures).

The list of the dragonflies from Mount Kinabalu is drawn largely from the collection made by Mr. H. M. Pendlebury in 1929*. His captures include material from all altitudes from 600 feet up to 5,500 ft. As I wish to deal only with the forms which may be regarded definitely as belonging to the mountain fauna I have omitted almost all material from below 3,000 feet. In the descriptive notes at the end of the lists I have, however, given an account of a new species of *Drepanosticta* taken at Kabayau at 600 feet.

The lists from Malayan localities are drawn from various sources, but chiefly from material sent to me from the F.M.S. Museum, and largely collected by Mr. Pendlebury.

Though our knowledge of the subject is still far from complete, it is at any rate clear that few or no dragonflies occur in Borneo above the altitude of 6,000 feet. That is in other words, the "Lower Mountain Zone" of Stapf is the highest zone in which dragonflies are to be found, except possibly for stray individuals. Of the species of the Order found within the limits of that zone (3,000–6,000 ft.) some few do not occur below the zone, whilst others range over the Lowland and Lower Mountain zones.

The species which do not appear to descend normally below 3,000 ft. may be taken as constituting the true mountain fauna of Borneo, a fauna which is well developed on Kinabalu, but is represented on other of the higher mountains of the Island. The conditions governing the development of a mountain fauna may be discussed under three headings.

I. Topographical.
II. Climate.
III. Oecological.

Of these, the first is the most important for the purposes of the present note. It covers such matters as the characters of streams and rivers, the rate of their current, the nature of the stream bed, and the presence of collections of still water, swamps, etc., and related to these characters the degree of aëration of the water, all points of importance to a group whose members pass a considerable part of their existence in water. Density of forest is probably also an important factor. Climatic conditions are of course such as temperature, wind-currents, humidity, and amount of sunshine.

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* H. M. Pendlebury and F. N. Chasen, A Zoological Expedition to Mount Kinabalu, British North Borneo (1929). Journ. F.M.S. Mus., XVII, 1932, pp. 1–38 pls. and map.

Lastly under the heading of Oecology I would put such points as the presence or absence of enemies, the abundance of food-supply and so forth.

The following is a list of the species known to occur in the 'Lower Mountain Zone' of Kinabalu and at a corresponding altitude on other mountains in Borneo. Species marked with an asterisk (*) are found also at lower levels.

Neurobasis (Matronoides) cyaneipennis Förster.
Kinabalu 3,000–4,000 ft., Mt. Batu Lawi 3,800 ft.

***Vestalis amœna** Selys.
Kinabalu 3,000–3,500 ft.

Vestalis beryllæ Laidlaw.
Kinabalu 3,000 ft. Retuh alt.?

Euphaea basalis Laidlaw.
Kinabalu 3,300 ft.

Euphæa subnodalis Laidlaw.
Kinabalu 3,000 ft.

***Devadatta** sp.
Kinabalu, up to 3,000 ft. With a wide range in Borneo.

Rhinoneura villosipes Laidlaw.
Kinabalu 3,300 ft.

Rhinocypha moultoni Laidlaw.
Kinabalu 3,000 ft.

Rhinocypha spinifer Laidlaw.
Mt. Batu Lawi alt.? (and elsewhere ? fide Martin).

Rhinocypha stygia Förster.
Kinabalu alt.?

***Libellago hyalina** Selys?

Cœliccia nemoricola Laidlaw.
Kinabalu 3,000–5,500 ft. Batu Lawi alt.? 3,700 ft.

Stenagrion dubium Laidlaw.
Kinabalu 3,000 ft. Mt. Batu Lawi about 3,000 ft.

Ceriagrion bellona Laidlaw.
Kinabalu 3,000 ft. Mt. Matang alt.?.

Protosticta kinabaluense Laidlaw.
Kinabalu 3,000 ft.

***Jagoria modigliani** Selys.
Mt. Selinguid, Batu Lawi 4,800 ft.

***Indæschna grubaueri** Förster.
Mt. Batu Lawi alt. ?.

(**Leptogomphus williamsoni** Laidlaw.
Madihit River, Batu Lawi 2,000 ft.)

Leptogomphus pendleburyi sp. n.
Kinabalu 3,000 ft.

***Orogomphus dyak** Laidlaw.
Kinabalu 3,300 ft.

Macromia euterpe Laidlaw.
Kinabalu 3,300 ft.

Macromidia fulva Laidlaw.
Kinabalu alt. ?.

***Orthetrum glaucum** Brauer.
Kinabalu 3,000–4,000 ft.

***Orthetrum testaceum** Burmeister.
Kinabalu 3,000 ft.

***Orthetrum sabina** Drury.
Kinabalu 3,000 ft.

***Orthetrum pruinosum clelia** Selys.
Kinabalu 3,000 ft.

***Trithemis aurora** Burmeister.
Kinabalu 3,000 ft.

***Trithemis festiva** Rambur.
Kinabalu alt. ?.

***Diplacodes trivialis** Rambur.
Kinabalu 3,000 ft.

***Neurothemis terminata** Ris.
Kinabalu 3,000 ft.

***Cratilla lineata** Brauer.
Kinabalu 3,000 ft.

The following species are from the Malay Peninsula. Perak: Larut Hills.

***Devadatta argioides** Selys.
3,000 ft.

***Rhinocypha fenestrella** Rambur.
3,000–4,000 ft.

Drepanosticta silenus sp. n.
4,500 ft.

Calicnemia rectangulata Laidlaw.
3,000–4,000 ft.

***Cœliccia didyma** Selys.
3,000–3,700 ft.

***Hemicordulia asiatica** Selys.
4,500 ft.

***Orthetrum triangulare** Selys.
3,000–3,700 ft.

***Diplacodes trivialis** Rambur.
3,000–3,700 ft.

***Neurothemis fluctuans** Fabr.
3,700–4,500 ft.

***Neurothemis fulvia** Drury.
4,500 ft.

***Pantala flavescens** Fabr.
4,500 ft.

Pahang: Cameron Highlands, 4,800–5,200 feet. Lubok Tamang 3,500 feet. Fraser's Hill, 4,000–4,200 feet.

Selangor: Bukit Kutu 3,000–3,500 feet.

***Climacobasis modesta** Laidlaw.
3,800 ft. Lubok Tamang.

***Rhinocypha fenestrella** Selys.
5,200 ft. Cameron Highlands.

***Devadatta argioides** Selys.
4,800 ft. Cameron Highlands.

***(Drepanosticta pan** Laidlaw.
1,800 ft. Batang Padang, Perak).

***Cœliccia albicauda** Förster.
3,500 ft. Lubok Tamang.

***Calicnemia chaseni** Laidlaw.

Calicnemia rectangulata Laidlaw.
Cameron Highlands 4,800 ft.

***Indæschna grubaueri** Förster.
4,200 ft. Fraser's Hill.

***Anax guttatus** Burm.
3,400 ft. Bukit Kutu, Selangor.

***Hemicordulia asiatica** Selys.
3,500 ft. Lubok Tamang.

***Orthetrum triangulare** Selys.
4,000 ft. Cameron Highlands.

***Diplacodes trivialis** Ramb.
3,500 ft. Lubok Tamang.
add.

Idionyx sp.
3,000 ft. Fraser's Hill.
From Gunong Jerai (Kedah Peak):—

***Vestalis gracilis** Selys.
400–3,000 ft.

***Devadatta argioides** Selys.
rock stream, 3,000 ft.

***Drepanosticta ? quadrata** Selys.
3,000 ft.

***Caconeura notostigma** Selys.
3,000 ft.

***Ceriagrion coromandelianum** Fabr.
3,300 ft.

***Aciagrion borneense** Ris.
2,400–3,400 ft.

***Onychargia atrocyana** Selys.
3,400–3,800 ft.

***Heliæschna idæ** Brauer.
3,300 ft.

***Cratilla lineata** Brauer.
3,300 ft.

***Orthetrum glaucum** Brauer.
3,000 ft.

***Neurothemis tullia** Fabr.
3,300 ft. at light.

***Rhyothemis obsolescens** Selys.
3,300 ft.

There is evidence of the existence of a dragonfly fauna confined to the 'Lower Mountain Zone' on Kinabalu and represented on some of the other high Bornean mountains. This fauna consists of species which presumably pass the whole of their life history within the altitudinal limits of that zone, breeding in such streams and other waters as the topography of the zone affords. Perhaps the most characteristic species of this fauna is the large and richly coloured *Matronoides cyaneipennis*.

On the other hand there is a certain number of species, found usually in forested country, whose range begins at a level often considerably lower than the base line of the Lower Mountain Zone. These species pass their larval life at lower levels as a rule, but it is permissible to suppose that some of them at any rate may find a suitable home in their larval state within the limits of the Zone in question. Typical examples of this group of species are *Devadatta* sp. and *Vestalis amœna*.

Lastly, many of the lower level species do not, and cannot, pass their earlier stages on the mountain, and the adults taken there are present as wanderers. Those species which travel far from their nurseries are mostly members of the subfamily Libellulinæ, and it is significant that six out of the nine species of Libelluline dragonflies recorded from above 3,000 ft. on Kinabalu are quite at home in the environs of Singapore.

The origin of the true mountain fauna of Kinabalu is a matter that will be of great interest for discussion. It includes three precinctive genera (allowing *Matronoides* to stand as a well marked section of *Neurobasis*).

Both *Rhinoneura* and *Stenagrion* are rather isolated and probably ancient. Beyond this, on our present knowledge it is impossible to make any useful statement.

The negative features of the mountain fauna proper are worth remarking. Noteworthy absentees are the genera *Caconeura, Disparoneura* and *Amphicnemis*, the characteristic Bornean *Brachydiplacini, Dysphæa* and peculiar Aeschnines, unless indeed *Linæschna* should prove to belong to this faunal group.

In the Peninsula on the other hand there appears to be no very clear evidence of a zonal distribution of the fauna. The lists give a number of forest haunting insects, and it is quite likely that some species will be found to have a range restricted to higher altitudes, but at present the fauna seems to fall into two categories only, viz. that of the forest stream insects, and that of the wanderers. Of the first *Rhinocypha fenestrella* is a good example. It has a vertical range of from below 1,000 ft. to above 5,000 ft. As to the second category, that of the wanderers, it will be noted that these are rather more varied than those of Kinabalu, but some of them are found at rather lower levels on Kinabalu itself e.g. *Pantala flavescens.*

I describe below the new species noted in the above lists, and also a new species from Kabayau at the foot of Kinabalu. I am indebted to Mr. D. E. Kimmins for figures 2, 3 and 4 that illustrate this account.

ANISOPTERA.

Family GOMPHIDÆ.

Leptogomphus pendleburyi sp. n. (Fig. 1, a & b).

1 ♂ Kiau, 3.000 ft. 5.4.29.

Abdomen 36 + 2 mm. Hind-wing 30 mm.

Head: black, genæ, a broad band on the upper lip, and horizontal part of frons, orange yellow.

Prothorax: black, a yellow spot on either side and a small middorsal, bigeminate spot of the same colour.

Thorax: black, a dorsal stripe on either side, not united by a mesothoracic collar, broad anteriorly, tapering toward the wing bases; and a vestige of the upper end of the ante-humeral band, orange yellow.

Laterally a yellow stripe just below the humeral suture, a second stripe, incomplete above on the first lateral suture, and a broader band just behind the second lateral suture, all of yellow.

Abdomen: black, with yellow markings on the sides of the first and second segments, auricles yellow, edged with black; and a very small, basal spot, of the same colour on the sides of the third segment. Segments 3–7 have a very fine line of yellow along the mid-dorsal carina. Segment 7 has a tiny frill of fine hairs at its base on the dorsum, arranged longitudinally.

Segment 10 has a pair of small tuberosities lying side by side on the dorsum, somewhat like those of *L. lansbergi,* but less conspicuous.

Legs: black, posterior surfaces of first pair of femora, yellow.

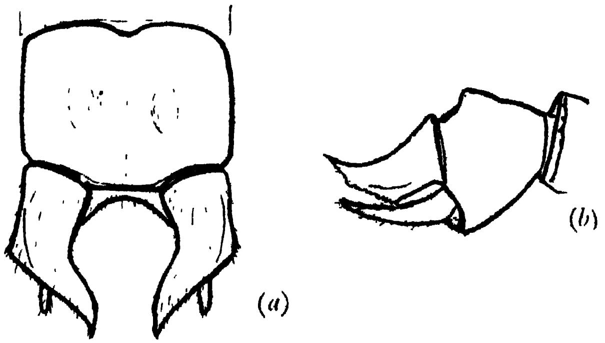


Fig. 1. *Leptogomphus pendleburyi* sp. n. ♂, type. Kiau. Mt. Kinabalu.
(*a*) Anal appendages from above.
(*b*) Same, seen from the right.

Anal appendages: black, upper pair about equal in length to lower appendage. Each of the upper pair is rather incurved apically, ending in a fine point which is rather up-turned. The outer margin of each has at about its middle a blunt external tubercle, beyond this the whole margin is finely dentate. The whole appendage is rather like the corresponding structure of a *Macromia.*

The lower appendage is bifurcate, the two branches are distant and parallel, separated by a wide semicircular bay.

Vesicle of penis small, hamuli large.

Wings: venation of the genus. Pterostigma long, dark gray-brown, unbraced. Basal post-costal present on all wings. Sectors of arculus separate at origin, then approximating. Anal triangle of three cells, anal area 3 cells deep.

Costal formula $\frac{12-17}{12-17} \qquad \frac{17-12}{12-12}$

A species remarkable for its very slender abdomen and dark colouring. From *williamsoni* which seems to be its nearest ally it differs in details of structure of anal appendages, of the genital structures of the second abdominal segment, in the absence of a yellow mark of the tenth segment of the abdomen, and in details of venation.

Holotype ♂, in the British Museum.

ZYGOPTERA.

Platystictinæ.

Drepanosticta silenus sp. n. (Fig. 2).

2 ♂ ♂ 1 ♀ Larut Hills, Perak, 4,500 ft. 20.2.32.

Abdomen ♂ 33 mm. Hind-wing 21.5 mm.
„ ♀ 30 mm. „ „ 21.5 mm.

Head: black with violet reflex; upper lip and anteclypeus chalky white.

Prothorax: light brown above, with a black band on either side.

Synthorax: dorsum and sides black with violet reflex, a broad white band on either side behind the first lateral suture. Ventral surface white.

Abdomen: brown passing to brown-black on the last four segments. The first two have some white on the sides, whilst 3–6 have a pale lateral mark on either side and a dark ring apically.

Legs: coxæ white; femora light brown with a black line along the posterior surfaces; tibiæ pale behind dark brown in front.

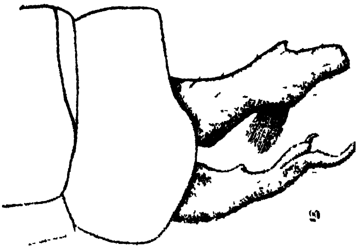


Fig. 2. *Drepanosticta silenus* sp. n. ♂, type. Larut Hills, Perak. Anal appendages, left side.

Anal appendages: brown-black. Upper pair each shaped rather like a goat's head with a remarkable beard-like brush of stiff hairs on the ventral aspect. Lower pair each nearly equal in length to upper appendages, forked apically, the outer and inner branches of the fork about equal; the inner branch directed inwards, the outer backwards.

Wings: venation of the genus. A V-shaped vein in the anal space under the base of the quadrangle. Pterostigma black, with a very narrow pale margin. 13 postnodals on the fore-wing. The colouring of the female is closely similar to that of the male.

The species is one of a small group which seems to be confined to the Peninsula.

It includes *pan*, *hamadryas*, and the present species, and is characterized by the extraordinary brush found on the upper anal appendages of the male.

Holotype ♂, in the British Museum.

Drepanosticta actæon sp. n. (Fig. 3).

1 Kabayau, 600 ft. 8.5.29. H. M. Pendlebury. (Kinabalu).

Abdomen 31 mm. hind-wing 20 mm. Anal app. .75 mm.

Head: black with metallic reflex. Base of upper lip and anteclypeus, yellow.

Prothorax: yellow, the anterior and narrow posterior lobes black. The latter has its sides produced to form a minute projecting spur on either side.

Synthorax: dorsum metallic black as far as the first lateral suture. Sides pale primrose yellow with a black stripe along the second lateral suture.

Abdomen: dark brownish-black above, paler below, and segments 7-8-9 also paler, possibly blue in life but more likely pale brown. Sides of the first segment yellow.

Legs: dull brown, the joints and tarsi darker.

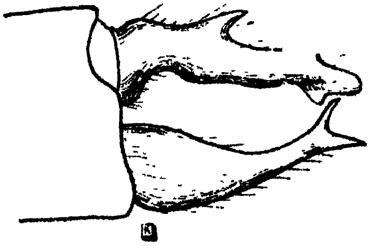


Fig. 3. *Drepanosticta actæon* sp. n. ♂. type. Kabayau, nr. Kinabalu. Anal appendages, left side.

Anal appendages: upper pair dark brown, each rather finger shaped, bending a little downwards, with a dorsal spine near the base. Each is slightly bifid at its apex. The lower pair are nearly equal in length to the upper pair, narrow rapidly after their origin, and each has rather the appearance of a once branched antler.

Wings with the venation of the genus. There is a Y-shaped vein below the quadrangle, with the stalk of the Y very short. Pterostigma rather large, rich brown.

Postnodal nerves

13———— ———13
12——————12

Distinguished from *rufostigma* Selys, the only other species of the genus so far recorded from Borneo, by the differently shaped anal appendages.

Holotype ♂, in the British Museum.

Platycneminæ.

Cœliccia nemoricola Laidlaw.

1 Lumu Lumu, Kinabalu. 5,000–5,500 ft.

I cannot feel absolutely sure as to the status of this form, but am inclined to look on it as a good species, though it may be a highland race of *membranipes*.

I owe it to the kindness of Mr. Lieftinck that I am able to compare the Lumu Lumu specimens with examples of typical *membranipes* from Java.

I give in tabular form the chief differences that I have found between the two.

nemoricola:

♂ Antehumeral stripe of the synthorax broad anteriorly, tapering to a point immediately in front of the ante-alar sinus.

Anterior half of segment 9 of abdomen black. Anal appendages black above.

Length of hind-wing 29 mm.

Post-nodal nerves

21——————21
19——————19

♀ Horn on posterior margin of prothorax about .75 mm. in length. Antehumeral stripe very narrow.

Markings on segments 8–9 of abdomen restricted to a lateral spot on each; those on 8 smaller than on 9.

Length of hind-wing 30 mm.

Post-nodal nerves

21——————21
19——————19

membranipes: Java, Mt. Slamat, Baturraden. 2,500 ft. (coll. Lieftinck).

♂ Antehumeral stripes of about equal breadth throughout. Only the anterior margin of segment 9 of abdomen black.

Length of hind-wing 26 mm.

Post-nodal nerves

19——————19
17——————17

♀ Horn on posterior margin of prothorax scarcely more than .25 mm. long.

Antehumeral stripe of the same breadth as in the male, decidedly broader than in *nemoricola.*

Markings on segments 8–9 of abdomen consist of lateral spots which extend upward to the dorsum and are only separated by the fine line of mid-dorsal carina. Spot on 8 larger than that on 9.

Length of hind-wing 27.50 mm.

Post-nodal nerves

$$\frac{18\text{———————}19}{19\text{———————}19}$$

I can detect no specific differences either in the anal appendages of the males or in the penes.

It may be noted that whereas in *membranipes* from Java the colour pattern of the synthorax is identical in the two sexes, in *nemoricola* there is a decided difference.

Lastly a teneral male from Kenokok, from about 3,300 ft. on Kinabalu, agrees rather more closely so far as one can judge with the Javanese specimens than do the examples from Lumu Lumu. This individual has the anal appendages black above, but the thoracic and abdominal markings are very similar to those of the true *membranipes.*

Post-costal nerves as in the Lumu Lumu specimens.

Length of hind-wing 26.5 mm.

Cœnagriinæ.

Ceriagrion bellona Laidlaw. (Fig. 4).

Ceriagrion bellona, Laidlaw, Sarawak Museum Journal, II, 1915, pp. 274–275.

6 ♂♂, 3 ♀♀, Kiau, Kinabalu, 3,000 ft. March, 1929.

The anal crossing lies distinctly distal to the origin of the vein Ab.

11–13 postnodal cross-veins on fore wing.

Wings very slightly tinged with yellow, pterostigma dark brown.

♂ Head: orange-brown above, darker on the vertex; greenish-white below.

Prothorax and synthorax: greenish-brown above, rather dark, fading to a lighter, almost green-white on the sides and below.

Abdomen: carmine, the first segment brown above, the second orange red laterally, the apical segments becoming darker and duller, whilst the ninth and tenth are almost entirely black.

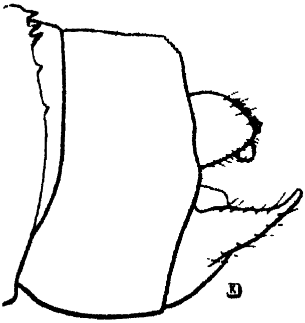


Fig. 4. *Ceriagrion bellona* Laidl. ♂, type. (Brit. Mus.), Kinabalu. Anal appendages, left side.

Anal appendages: upper pair black, rather inflated, with a small ventrally directed apical process. Lower pair dark brown, longer than upper pair, awn-shaped, their apices directed upward.

Legs: orange-yellow.

♀ Colouring in general a dull almost uniform, dark brown, passing to a lighter greenish-brown on the sides of the thorax, and on the ventral surfaces generally.

Abdomen ♂ 32 mm. ♀ 30 mm.

Hindwing ♂ 21 mm. ♀ 22 mm.

The structure of the anal appendages of the male is not very unlike that of the common *C. coromandelianum* Fabr. The colouring is of course very different in the two species.

XXXVI. COLEOPTERES NOUVEAUX DE LA PRESQU'ILE MALAIS.

Par M. PIC.

Les nouveautés ci-dessous décrites font partie des collections du British Museum, mais je possède des co-types de *Dascillus rubropubens*, *Macrocyphon pendleburyi*, et *Macroeubria impressicollis*.

Family DASCILLIDÆ.

Dascillus rubropubens sp. n.

Elongatus, nitidus, niger, supra dense rubro pubescens, aliquot sutura, thorace ad basin paulo griseo pubescentibus, infra corpore griseo pubescente. Antennis sat gracilibus et elongatis; thorace parum breve, sat lato, antice attenuato, dense punctato, medio postice sulcatulo; elytris thorace non latioribus, elongatis, apice attenuatis striatis. Long. 10 mm.

Cette espèce, très distincte par son revêtement particulier, peut prendre place près de *D. rufofemoralis* Pic.

Malay Peninsula: Pahang (H. M. Pendlebury).

Epilichas apicicornis sp. n.

Oblongo-elongatus, nitidus, griseo pubescens, niger, antennis apice testaceis, thorace et femoribus ad basin rufis Antennis gracilibus, sat brevibus; thorace breve et lato, antice subarcuato, angulis posticis fere rectis, diverse non dense granuloso, medio sulcatulo; elytris thorace paulo latioribus, elongatis, postice attenuatis, fortiter striato-punctatis. Long. 8 mm.

Cette espèce se distingue de celles connues, soit par les antennes ayant leur derniers articles testacés, soit par les élytres fortement striés.

Malay Peninsula: Pahang (H. M. Pendlebury).

Family HELODIDÆ.

Macrocyphon pendleburyi sp. n.

Grande, elongatum, nitidum, sparse griseo pubescente, nigropiceum, aliquot rufo-brunneum (var.), femoribus rufis. Capite robusto, dense granuloso; antennis gracilibus; thorace breve et lato, ad medium paulo, postice et antice attenuato, angulis anticis latis et prominulis, dense granuloso; elytris thorace paulo latioribus, elongatis, postice attenuatis, antice arcuate impressis, in disco breve costulatis et longitudinaliter impressis, minute diverse, ad basin excepto, sat sparse punctatis. Long. 8–9 mm.

Cette espèce se distingue des anciennes connues de la région par sa grande taille ainsi que par les angles antérieurs du prothorax larges et avancés en avant. Elle diffère, à première vue, de l'espèce africaine, *M. grande* Pic, par les angles du prothorax avancés et la ponctuation moins rapprochée des élytres.

Malay Peninsula: Pahang (H. M. Pendlebury).

Ptilodactyla pendleburyi sp. n.

♂. Oblongo-subovato, nitida, subdepressa, griseo pubescens, pro parte hirsuta, rufa aut brunnescens, pedibus testaceis. Capite sparse granuloso-punctato; antennis piceis, flabellatis; thorace breve, antice valde attenuato et subarcuato, fortiter sat sparse subgranuloso-punctato; elytris thorace non latioribus, sat brevibus, lateraliter subarcuatis et marginatis, postice attenuatis, distincte striato-punctatis, striis apice evanescentibus, intervallis parum fortiter et irregulariter punctatis. Long. 4 mm.

Cette petite espèce se rapproche de *P. subelongata* Pic, et s'en distingue par la coloration moins foncée, la forme plus élargie, les intervalles des élytres plus larges.

Malay Peninsula: Selangor (H. M. Pendlebury).

Cyphon grande sp. n.

Oblongo-subovatum, parum convexum, nitidum, sparse griseo pubescente, rufo-testaceum, capite postice, thorace medio, elytris ad basin breve piceis, antennis rufis, brunneo annulatis. Capite minute et sparse punctato, oculis nigris, valde distantibus; antennis sat gracilibus, articulo 1° grande et lato; thorace breve et lato, antice attenuato, minute et sparse punctato; elytris oblongo-subovatis, postice valde attenuatis, paulo marginatis, parum fortiter, sat sparse et irregulariter punctatis, incostatis, pedibus testaceis, validis. Long. 4. 5. mm.

Peut se placer près de *C. foncki* Pic, en diffère nettement par la taille plus grande, la coloration, les élytres plus attenués à l'extrêmité.

Malay Peninsula: Pahang (H. M. Pendlebury).

Macrœubria apicicornis sp. n.

Subovato, nitido, griseo pubescens, rufa, scutello elytris pedibusque pro parte nigris, antennis nigris, articulis duabus ultimis flavis. Capite non prominulo; antennis robustis, articulo 3° triangulare, 4° et sequentibus brevibus longe dentatis, ultimo apice truncato; thorace breve et lato, antice valde attenuato et paulo inciso, angulis anticis nullis, minute et dense punctato; elytris subovatis, humeris rotundatis, paulo prominulis lateraliter subarcuatis, postice attenuatis, fortiter striatis, striis pro parte reductis et postice connexis, intervallis convexis, minutissime punctatis, pedibus parum crassis, tarsis gracilibus, nigris, tarsis femoribusque pro parte rufis. Long. 4 mm.

Très distinct de *M. striatipennis* Pic, par sa forme plus trapue, sa cloration plus foncée, les striés plus fortes des élytres.

Malay Peninsula: Perak (H. M. Pendlebury).

(?) **Macrœubria impressicollis** sp. n.

Oblongo-subovata, pro parte griseo-holosericeo pubescens, testacea, elytris signaturis flavis ornatis; thorace impresso, brunneo ornato. Capite non prominulo, oculis nigris; antennis testaceis, elongatis, parum gracilibus, articulo 3° elongato, 4° sequentibus non brevibus, diverse dentatis, ultimo apice subtruncato; thorace breve et lato, antice valde attenuato et paulo inciso, angulis anticis nullis, minute punctato, supra inæquale et multi brunneo impresso; elytris oblongo-subovatis, humeris rotundatis, paulo prominulis, lateraliter subarcuatis, postice attenuatis, fortiter striatis, striis externe diverse reductis et antice aut postice connexis, diverse flavo notatis; pedibus testaceis, sat gracilibus, tarsis angustatis. Long. 4 mm.

Très distincte de l'espèce précédente, par les antennes moins robustes, entièrement testacées, le prothorax impressionné, les élytres à striés moins régulières et á dessins flaves.

Malay Peninsula: Pahang (H. M. Pendlebury).

Ectopria multimaculata sp. n.

Subovata, nitida, supra pro parte glabra, pro parte squamuloso maculata, infra, griseo pubescens, elytris multi reticulatis, testacea, capite postice, antennis, pectore et femoribus pro parte nigris. Capite paulo prominulo, oculis nigris, antennis crassis, subfiliformibus, apice attenuatis, nigris, articulo 2° testaceo et breve; thorace sat breve et lato, antice valde attenuato, non inciso, angulis anticis fere rectis, lateraliter anguste marginato, supra reticulato, griseo multimaculato; elytris sat brevibus, lateraliter subarcuatis, postice attenuatis, humeris nullis et paulo prominulis, reticulatis, multi et irregulariter albo et griseo maculatis; femoribus parum crassis, tarsis gracilibus. Long. 3 mm. (environ).

Cette petite espèce est très distincte par la présence, sur le dessus du corps, de nombreuses macules pâles, recouvertes d'une pubescence grise un peu soyeuse fait de poils un peu squamuleux.

Malay Peninsula: Pahang (H. M. Pendlebury).

Family ANOBIIDÆ.

Xystrophorus hirsutus sp. n.

Elongatus, parum nitidus, griseo aut luteo pubescens et fusco hirsutus, nigro-piceus, thorace antice, elytris pro

parte, antennis tarsisque rufis. Capite parum elongato, granuloso; antennis sat gracilibus et filiformibus, articulis elongatis; thorace sat breve et parum lato, antice transverse sulcato, postice lateraliter mediocre impresso et medio supra obtuse elevato, sat dense granuloso; scutello luteo pubescente, apice truncato; elytris thorace sat latioribus, elongatis, apice attenuatis, declivibus et subrotundatis, parum fortiter, pro parte sat regulariter punctatis, luteo multi et diverse maculatis, pedibus sat gracilibus. Long. 7 mm.

Voisin de *D. mouhoti* Pic, en diffère par le dessus du corps orné de poils dressés, la tête plus engagée dans le prothorax qui est plus densement granuleux, bordé de roux en avant, la ponctuation plus forte et moins régulière des élytres dont la pubescence, en outre, est moins continue et nettement mouchetée.

Malay Peninsula: Selangor (H. M. Pendlebury).

Clada impressipennis sp. n.

♀. Minuta, oblonga, subopaca, parum pubescens et breve hirsuta, nigra, supra pro majore parte rufescens, capite medio, thorace pro parte, scutello, humeris et geniculis aurato-fulvo pubescentibus. Capite breve et lato, granuloso, oculis sat validis; antennis crassis, subdentatis, sat elongatis; thorace parum breve, sat lato, lateraliter sinuato, antice late transverse impresso, postice lateraliter late et profonde impresso, impressis carinato marginatis, medio supra obtuse elevato, minute, antice sparse granuloso; scutello luteo pubescente, apice truncato; elytris thorace valde latioribus, parum elongatis, postice attenuatis, declivibus et crenulatis, supra multi impressis et pro parte transverse et reducte plicatis, mediocre pro parte lineato punctatis; pedibus sat validis. Long. 5 mm.

Cette espèce, très distincte par ses élytres impressionnés et plissés en travers peut se placer près de *C. ocularis* Pic, dont elle diffère, en plus de la sculpture des élytres, par les antennes différentes, la tête plus engagée dans le prothorax, les yeux moins gros, le prothorax fortement impressionné avec la gibbosité dorsale plus prononcée.

Malay Peninsula: Selangor (H. M. Pendlebury).

XXXVII. A NEW AGARISTID MOTH FROM THE MALAY PENINSULA.

By H. M. PENDLEBURY.

Mimeusemia vittata jordani ssp. n.

♂. Head and thorax blackish-brown with a slight reddish tinge: fore tarsi narrowly white banded; abdomen black brown with broad orange bands; claspers covered with a black tuft. Forewings dark reddish-brown; a conspicuous subbasal, subquadrate, creamy-white spot in the cell extending into the upper half of space 1; an oblique postmedial band of creamy-white from just below costa to space 1, incised at the lower angle of the cell; the basal three-quarters of the wing with some scattered steely blue scaling consisting of a costal patch near the base, a discal and discoidal streak and points below it at the origin of vein 2 and across vein 1, a post median series of streaks beyond the creamy-white band, and streaks below this band at the tornal angle.

Hindwing orange; the base brown; with a brown border which is narrowest on the costal margin leaving a larger area of the costal brown spot free than in *vittata vittata.*

Underside duller; markings as on the upperside but with an additional small blurred subtriangular white mark between the costa and the upper angle of the cell. Hindwing with a light yellow patch between the brown base and the large brown costal spot.

♀. Similar to the ♂ but larger in size.

Expanse: ♂, 51 mm.; ♀ 57–59 mm.

Selangor: Kuala Lumpur, at light, Dec. 23rd, 1929; Dec. 20th, 1932; Bukit Kutu, 3,300 feet, at light, Sept. 21st, 1932 (all H. M. Pendlebury).

This race differs from *M. vittata vittata* (Btlr.) described from Java, in having a large quadrate creamy-white spot in the cell of the forewing. The black border of the hindwing, furthermore, is narrower especially at the costal margin giving a much larger free portion to the black costal spot.

Unlike the majority of the Malayan Agaristidæ, this species appears to be nocturnal in its habits, and is attracted to light.

I am indebted to Dr. K. Jordan, F.R.S., for having pointed out the distinctive features of this new race.

XXXVIII. SUPPLEMENTARY NEUROPTEROID INSECTS FROM THE MALAY PENINSULA, AND FROM MT. KINABALU, BORNEO.

By NATHAN BANKS.

(With twenty-three figures).

After the publication of papers on these insects the Selangor Museum sent me additional material. Much of this is the same as previously reported, some however are new records and a few are new species. These are here recorded. Attention should be called to the Rhyacophila from Mt. Kinabalu as further evidence of the relationship to the Asiatic mainland; no species of this mountain loving genus has previously been listed from these islands.

These species of Psocidæ are chiefly those widely distributed in the Malay region. The Myrmeleonid from Kinabalu is a very fine and handsome species.

Malay Peninsula.

PSOCIDÆ

Psocus taprobanes Hag.

Cameron Highlands, Tanah Rata, 24 May, 4,800 ft.

Psocus luteolus Bks.

N. Sembilan, Port Dickson, 23 Dec.

Amphipsocus pilosus Hag.

Kuala Lumpur, 3 April.

Tæniostigma elongata Hag.

Larut Hills, 10 Febr., 3,700 to 4,000 ft.

Myopsocus undosus Hag.

Kuala Lumpur, 30 Oct., 11 May, and Langkawi Island, 14 April.

Calopsocus infelix Hag.

Larut Hills, 20 Febr., 4,500 ft., and Fraser's Hill, 19 June, 4,200 ft.

NEUROPTERA.

Berothella gen. nov.

Related to *Nosybus*, and of the same general appearance. The radius and subcosta are separate to tip, a cross-vein connecting them behind the stigma; three radial cross-veins. The other venation is different. The radial sector arises much nearer to the base of the wing, it has four branches: the median, cubital, and anal veins near the base are bent upward in a prominent curve, the median not united to the radius; the gradates form a series of five before the middle, but several cross-veins before them, and three in a broken series beyond it, but scarcely beyond the middle of the wing (not as far out as in *Nosybus*). The hind wings are more like *Nosybus;* three radial cross-veins and three branches to the radial sector, five cross-veins before middle forming a gradate series, but more in the apical part of wing. Body, legs, and wings with the long hair very similar to *Nosybus*. Antennæ of male rather heavy, not hairy, more like *Berotha* than *Nosybus*, but the basal joint not elongate; abdomen without noticeable appendages.

Berothella phantoma sp. nov. (Fig. 8).

Pale yellowish throughout; across the wing at main gradate series is a faint brownish band, and toward the tip of the wing a few other faint brown marks more or less in bands; the long hairs on the wings and the fringes are yellowish, the costal fringe is more or less interrupted with pale brown, especially toward the base of wing. The venation is pale yellow, but two or three of the upper gradates are brownish. The long hairs on the legs are white; the abdomen is yellowish brown, with short, brighter yellowish hair. In forewings there is a black dot in the discal cell as shown in the figure. The antennæ are without noticeable hair, and but little on the head; there are some long pale hairs on the pronotum and rest of the thorax above; the pleura are bare.

Expanse 14 mm.

Bukit Kutu, 3,500 ft., Selangor, 18 March (Pendlebury).

Ankylopteryx polygramma Gerst.

Kuala Lumpur, 28 April, at light.

Sisyra indica Needham.

Langkawi Island, West Coast, 25 April.

Notiobiella tumida Navas.

Langkawi Island, West Coast, 29 April. It was described as a new genus, Vaja, from Java. I have shown that these forms with the elongate pronotum are the true Notiobiella, while the Indian species, *inquus* Hagen belongs to Annandalia.

Eumantispa hamiltonella Westw.

Bukit Kutu, 12 March, 3,500 ft., described from East India.

TRICHOPTERA.

Anisocentropus salsus Betten.

One from Bukit Kutu, 14 March, 3,500 ft.; described from Upper Assam.

Oecetinella lias Hag.

Kuala Lumpur, 30 March; a rubbed specimen, apparently of this Ceylonese species.

Polyplectropus javanicus Ulmer.

Bukit Kutu, Selangor, 9 March, 3,500 ft.; and Kedah Peak, 15 March, 3,000 to 3,500 ft. Known from Java and Sumatra.

Hydropsyche flavata sp. nov. (Figs. 13, 15, 19).

Pale yellowish throughout, the antennæ distinctly banded with brown, brighter yellowish on the vertex and dorsum of thorax, fore wings with similar, but short, bright yellowish hair, fringes pale, that near base of hind wings very long and yellowish, spurs yellowish. In fore wings the discal cell is fully three times as long as broad, fork 1 with a pedicel longer than width of discal cell, fork 2 back on discal cell for over width of cell, median cell nearly twice as long as discal, at its basal fourth with a cross vein to the cubitus, fork 3 with pedicel as long as that of fork 1, fork 4 back on median cell more than width of cell, base of fork 5 opposite to base of fork 4, the anals unite for some distance before the margin, about the width of a cell.

Expanse 16 mm.

Kuala Lumpur, 21 April, 2 April, 15 June.

The union of the anals before margin is unusual in this genus, but otherwise it is a normal *Hydropsyche*.

Pseudoneureclipsis ramosa Ulmer.

Larut Hills, 16 Febr., 3,700 ft.; and Fraser's Hill, Pahang, 27 June, 4,200 ft.; described from Java.

Nyctiophylax abrupta Bks.

Kuala Lumpur, 9 Febr.: and Malaya, Negri Sembilan, Port Dickson, 19 Nov.; described from India.

Glossosoma malayanum sp. nov. (Figs. 3–6).

Head brown, white hair in front and above base of antennæ, warts with gray hair; thorax brown, with a median gray stripe; abdomen brown above, pale below; legs yellowish, with long, brown spurs; antennæ pale on basal third and here annulate with brown, the annuli becoming broader and over apical half wholly brown; fore wings brown, with fine yellow and longer black hair, three white spots, one on cross-vein back of discal cell, one on connection of median and cubitus, and one up from end of anal; fringe nearly black; hind wings gray, darker along costal area, fringe gray. In the male there is a very large swollen area at base of fore wing, larger and more circular than usual, the basal three-fourths of it yellow, with yellow hair; male genitalia as figured, the ventral spoon-shaped process very broad. Venation similar to that of other species: in fore wing the discal cell is very broad, above not quite connected to the radius; in hind wing the discal cell is plainly smaller than in fore wing, and proportionally more elongate.

Expanse 13 mm.

Fraser's Hill, Pahang, 4,000 to 4,200 ft., 31 May, and 6 July.

A female (15 mm. expanse), from Larut Hills, Perak, 3,700 ft., 12 Febr., is quite probably the same species; the wings are darker, but the venation the same, except that the discal cell of the fore-wing is hardly as broad, the mid tibiæ and basitarsi are dilated, fork 2 of hind wing reaches discal cell as in male; maxillary palpi (as in male) last joint slender, cylindric, scarcely as long as the third.

BORNEO.

PSOCIDÆ.

Psocus taprobanes Hag.

Kiau, Kinabalu, 21 May, 3,000 ft.

Psocus lemniscatus Enderl.

Marei Parei, Kinabalu, 30 April, 5,000 ft.

PERLIDÆ.

Neoperla (Tetropina) fulgescens Klap.

One from Kenokok, 24 April, 3,300 ft. Described from Mt. Kinabalu.

Neoperla (Tetropina) larvata Klap.

Two from Kabayau, 600 ft., 6 May. Described from Mt. Kinabalu.

Neoperla variegata Klap. (Fig. 7).

Two from Kenokok, 28 April, 3,200 ft. Readily known by the dark median line on pale pronotum. The male has a slender unforked process from dorsal segment.

Neoperla fuscigera Klap.

Several from Kenokok River, 24 April, 3,300 ft., and Tenompok Pass, 18 April, 4,200 ft. Described from Mt. Kinabalu; *N. naviculata* Klap. is probably the same as *N. borneensis* Enderlein, which we have already recorded from the mountain.

Neoperla sp.

One from Lumu Lumu, 16 April, 5,500 ft. It belongs to the section in which the cubital fork starts beyond the first cubito-median cross-vein, as does the Bornean *N. hageni* and several Philippine species. It is larger than *N. hageni*, and the venation darker; but it is much smaller than the other species recorded above, with an expanse of about 12 mm.

NEUROPTERA.

Acratoleon dispar sp. nov. (Figs. 1, 2).

Face and palpi yellowish, vertex dark brown, a gray transverse band above antennæ, latter brown, darker at tips; pronotum yellowish, with a dark stripe each side, and some dark lines near middle, rest of notum mostly black, with some yellowish around mesoscutellum, and on basal part of metanotum, pleura pale, with two dark stripes near together, the upper one wider: legs largely yellowish, broadly dark on tips of femora, and on bases and tips of the tibiæ, tarsal joints dark at tips; abdomen brown, an elongate pale spot above near middle of each segment, except the last. Wings hyaline, veins pale, the longitudinal ones often marked with dark, some cross veins also dark; in fore wing between the subcosta and radius are about seven or eight brown spots; stigma whitish, small; behind most of these brown spots there is brown on the cross vein from radius to radial sector, in the radial field there is also six or more small brown clouds; a distinct brown cloud a little before the tip; medio-cubital cross veins narrowly margined with brown, a rather large oblique mark just beyond cubital fork, and several veins beyond this with a few dark spots, and a curved mark at rhegma; hind wings show an upcurved mark at end of the radius before the tip of wing, and a small dark cloud near rhegma, and another near end of first branch of radial sector.

Fore wings rather broad, hind wings very narrow toward base, both almost acute at tips, hind wings plainly longer than the fore wings. Fore wings with radial sector much before cubital fork, about five cross veins before origin of radial sector, two of them crossed, five branches to radial sector, cubital area wide, with four or five cells across, costals mostly simple, but some forked, especially toward stigma, no gradates in apical field, usually four cross veins between cubital fork and anal vein; second anal runs out in an even curve, but bends down and plainly unites with the third anal for a short distance; basal cubital fork distinct, and with two cross veins to cubitus and two to anal vein. Hind wings with a few costals near stigma forked, before radial sector two cross veins in one wing, three in other wing, about eight branches to radial sector, a few gradates in apical field, about twelve anal cross veins, the anal margin very plainly concave.

Abdomen is very much shorter than the wings. Legs very long and slender; basal tarsal joint about as long as the apical joint; spurs very slender, little curved, reaching a little beyond the second tarsal joint; claws moderately short and stout.

Fore wings long 34 mm. wide 12.5 mm.

Hind wings long 37 mm. wide 8.5 mm.

Abdomen long 22 mm.

One from Lumu Lumu, Kinabalu, Borneo, 5,500 ft., 16 April.

This differs a little in tarsal structure from the type of the genus, but it is closely allied to it by various characters, particularly by the second anal vein united to the third anal for a short distance.

Coniopteryx remota sp. nov. (Fig. 23).

Head and thorax above nearly black, pleura brown, abdomen yellowish, legs brownish, antennæ brown. Wings nearly evenly fumose, sometimes very dark, venation yellowish brown. Fore wing with venation as figured: the cross-vein from radius to the radial sector ends before the forking of the radial sector, the fork of the radial sector at base is broadly rounded; the cross-vein from medius to cubitus is out a short distance on the lower fork of the medius.

In hind wings the cross vein from radius to radial sector ends at base of the fork of radial sector, and the third anal is so short and near margin as to be scarcely visible.

Expanse 8.5 to 9 mm.

From Pakka, Kinabalu, Borneo, 10,000 ft. and Kamborangah, 7,000 ft. from 20 to 27 of March.

TRICHOPTERA.

Limnocentropus grandis sp. nov. (Figs. 12, 21).

Body dark brown; head and thorax with black and yellow hair, legs with much brown hair and short black spines; antennæ brown on basal and snow-white on the apical part of each segment beyond the second; wings a uniform dull brown, with much fine pale hair on the membrane and long black hairs on the veins; the subcosta and radius narrowly bordered with dark; fringes dark brown on the forewing, paler on the hindwing. Male genitalia with two long shining reddish brown median pieces above, below on each side a long curved hook, the superior pieces much more slender than in *L. borneoinus*. Venation very similar to that of *L. insolitus*, fork 2 does not go back so far on the discal cell, and fork 3 has a rather shorter pedicel; in the hindwings the discal cell is much shorter than in *L. insolitus*, much shorter than its pedicel, only about one-half as long. The maxillary palpi are shorter than in *L. insolitus*, but the proportions are about the same, the last joint scarcely longer than the third.

Expanse 37 to 44 mm.

Marei Parei 30 April, 5,000 ft., and Kamborangah, 24 April, 7,000 ft., both on Mt. Kinabalu.

Rhyacophila isolata sp. nov.

♀. Body reddish brown, head and thorax with dark brown to black bristles, and a few yellowish ones; antennæ dark, annulate with pale; legs brown, but hind legs mostly pale. Fore wing with erect bristles on basal part of anal veins, mostly black, but some yellowish, rather large golden spots in anal area and some in basal part, beyond middle with a great number of small golden spots, which, toward tip tend to form rows. Along the outer margin are areas wholly black at ends of the veins, a large dark spot above end of fork 1; above upper outer corner of discal cell there a dark spot reaching up to margin, and less distinctly, but rather broadly, obliquely behind; another dark spot just beyond base of fork 3 and reaching up to next vein; at the forking of median vein there is a prominent hyaline white spot; the outer fringe is alternately yellowish and black. Hind wings gray dark on upper tip, with a black fringe on the hind margin, but the outer margin with a yellowish fringe except at ends of the veins.

In fore wings the pedicel of discal cell is about as long as fork 2; fork 2 reaching back plainly further than fork 1, fork 3 with a pedicel as long as itself, fork 4 about as far back as base of fork 2, toward tip this fork is much wider than the others, fork 5 runs back plainly before base of discal cell. In hind wings fork 3 is longer than its pedicel, and fork 5 is back as far as base of the base of discal cell.

Hind tibiæ with the usual spines very numerous and distinct; tip of abdomen of female very much tapering.

Expanse 30 mm.

Pakka, Kinabalu, Borneo, 10,000 ft., 24 March.

The presence of a large species of Rhyacophila high up on Kinabalu again shows the affinity of this area with the highlands of the Asiatic continent.

Ganonema pallicorne McLachl.

One from Mt. Kinabalu 3–4,000 ft., 3 May; described from Borneo.

Asotocerus umbrosus Bks.

One from Kabayau, 6 May, 600 ft.; described from Puerto Princesa, Palawan Island.

Gœra octospina Bks.

One from Kabayau, 12 May, 600 ft.; described from the Philippines.

Gœra tagalica Bks.

Lumu Lumu, Kinabalu, 6 April, 5,500 ft.; described from Luzon.

GŒRINELLA.

The three known species from Kinabalu are separable as follows:—

Females

1—Fork 5 goes back to the cross-vein..................2
Fork 5 stops much before cross-vein.........*conjuncta*

2—Expanse about 25 mm.; basal antennal joint much longer than head width...............*grandis*

Expanse about 15 mm.; basal antennal joint but little if any longer than head-width.......*media*

Males

1—Fork 3 is a closed cell, that is the branches unite before margin..........................*conjuncta*
Fork 3 not forming a cell..........................2

2—Expanse about 15 mm.; fork 3 nearly truncate at base, the lower branch of cubitus here bends down toward the anal and almost unites with the anal........................*media*

Expanse about 25 mm.; fork 3 acute at base, lower branch of cubitus running out free from the anal............................*grandis*

Gœrinella conjuncta sp. nov. (Figs. 10, 20).

♂. Brown, wings a uniform brown, black dot in base of fork 2, legs paler brown, basal joint of antennæ dark brown, beyond pale. Head and thorax with dark brown hair; basal antennal joint about as long as head width, somewhat curved, the inner edge near middle protuberant, clothed with much very long brown hair, and tufts of dense shorter black hair, especially on inner sides; palpi pale, slender, with tufts of dense brown hair at tip.

In fore wings the discal cell not near as long as pedicel, fork 1 reaching back on discal cell the full width of cell, fork 2 not reaching so far back as fork 1, fork 3 not as far back as base of discal cell, the two branches uniting quite a distance before the margin and forming a closed cell, lower branch of cubitus near the cross vein does not bend toward anal but runs out well free from anal. Male appendages as figured, the lateral process with slender spine at tip, and on inner side with a forked process; each part slender and swollen near tip; median plate with four prongs at tip.

♀. Very similar to male; a pale spot at base of fork 2 and one on cubitus before it forks; basal joint of antennæ straight, but nearly as long as in the male; forks 1 and 2 as in the male; branches of fork 3 do not unite, but run out normal to margin; fork 5 does not extend back to cross vein between branches of cubitus; the second anal is forked twice toward base.

Expanse 17 mm.

Lumu Lumu, Kinabalu, Borneo, 5,500 ft., 16 April.

Gœrinella media sp. nov. (Figs. 11, 17, 18, 22).

♂. Pale brown, antennæ beyond basal joint yellowish; wings pale brown, with the usual two hyaline spots in front pair. Basal joint of antennæ not as long as head width, slender and probably hairy (rubbed in type). Wings with the usual hairs and scales; in fore wing the discal cell is as long as its pedicel, and not as slender as in some species; fork 1 does not reach back on discal cell, and is rather broad at base, fork 2 reaches back a short distance on discal cell, fork 3 runs out normal; the lower branch of the cubitus near the cross-vein bends down toward anal and almost or quite unites with it, but near tip bends out to form the usual cell; all of the apical cells are rather broad.

The lateral male appendages are cleft at tip, the superior plate slender, and beneath it a long slender curved process each side.

The female is similar to the male, the basal joint of antennæ about as long, slightly hairy; the fore wing has the discal cell as long as its pedicel, fork 1 back on discal cell a very short distance, its base rather broad; fork 2 as in male, fork 3 reaches back as far as fork 2, and fork 5 reaches back to the cross-vein.

Expanse 16 mm.

Lumu Lumu, Kinabalu, Borneo, 5,500 ft., 3 to 17 April.

Polymorphanisus nigricornis Walk.

One from Kabayau, 14 March, 600 ft.

Macronema trifasciatum sp. nov.

Pale yellowish; legs unmarked, except that the tips of the tarsal joints are often a little darker; antennæ pale; fore-wings yellowish with three dark bands, one near base, not reaching the costa; one at middle formed of four connected spots, and leaving a pale central area; the third band is broad and covers the apex, the inner margin darkest and irregular. Venation similar to that of the *fastosum* section of the genus.

Expanse 24 mm.

Several from Kabayau, Kinabalu, 12 May, 600 ft. This is probably the form "f" which Ulmer lists as a form of *M. fastosum*, a species typically confined to the mainland and with mostly black antennæ and very different wing markings.

Dipseudopsis infuscata McLachl.

Marei Parei, Kinabalu, 2 May, 5,000 ft.; widely distributed in the Malay region.

Hydromanicus hermosus sp. nov. (Figs. 9, 14, 16).

Head yellow, with yellow hair, a large transverse black spot over the front part of the vertex; thorax mostly yellow, also with yellow hair; abdomen brown above, yellowish beneath; forewing deep brown, each with about thirteen mostly large, yellowish spots, as in the figure; two at or near middle and nearly or quite connected to form a band, four near the base, and three near tip; where these spots touch the margin the fringe is yellowish, elsewhere brown. Hindwings a nearly uniform brown, about as dark as the fore pair, fringe brown. Antennæ yellowish brown, the basal joints paler; palpi more yellowish; legs yellowish, the hind tibiæ darker and with much brown hair. Forewings not as elongate as in *H. flavoguttatus* or *H. jacobsoni*, the venation similar, but the discal and median cells shorter, the crossvein back from the median cell is hardly oblique, and that to the cubitus is very faint and where visible is straight across, not oblique, and more basally placed than in *H. flavoguttatus*. Hindwings very similar to *H. flavoguttatus* but the discal cell is here also a little shorter, and the first fork hardly one-half way back on the discal cell.

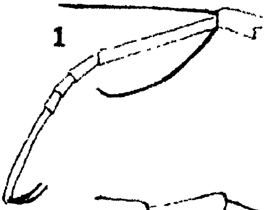
Expanse 22 mm.

From Kiau, 12 April, 3,000 ft., Mt. Kinabalu.

Explanation of Figures.

Fig. 1—Acratoleon dispar, tarsus.
2—Acratoleon dispar, base of forewing.
3—Glossosoma malayanum, genitalia.
4— „ „ forewing.
5— „ „ hindwing.
6— „ „ base of forewing.
7—Neoperla variegata, genitalia above.
8—Berothella phantoma, forewing.
9—Hydromanicus hermosus, genitalia, side.
10—Gœrinella conjuncta, genitalia, top.

11—Gœrinella media, genitalia, top.
12—Limnocentropus grandis, genitalia, top.
13—Hydropsyche flavata, hindwing.
14—Hydromanicus hermosus, forewing.
15—Hydropsyche flavata, genitalia, side.
16—Hydromanicus hermosus, genitalia, above.
17—Gœrinella media, forewing.
18—Gœrinella media, hindwing.
19—Hydropsyche flavata, midtarsus.
20—Gœrinella conjuncta, fore and hindwing.
21—Limnocentropus grandis, genitalia, side.
22—Gœrinella media, genitalia, side.
23—Coniopteryx remota, venation.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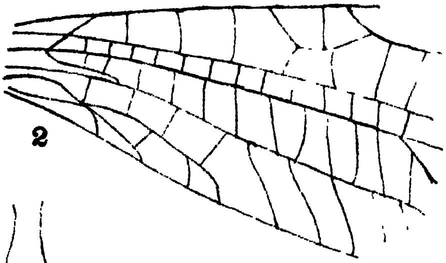
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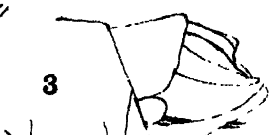
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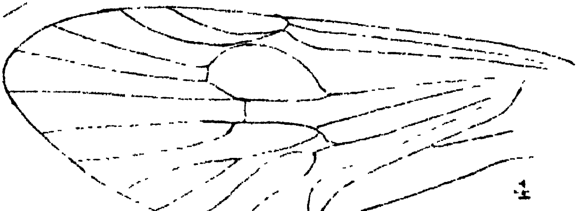
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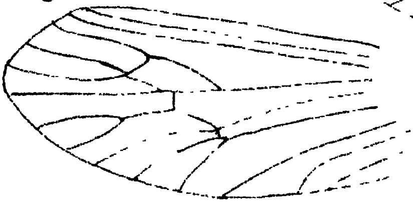
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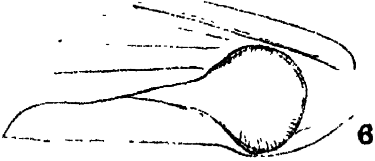
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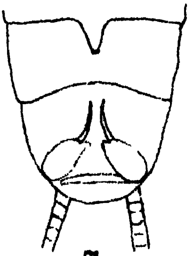
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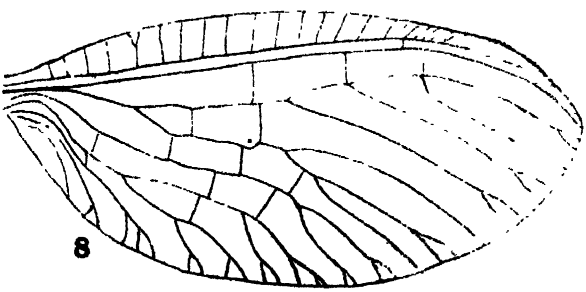
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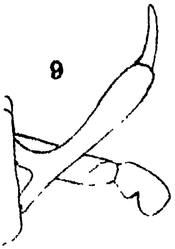
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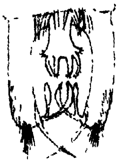
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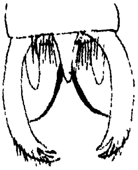
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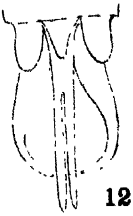
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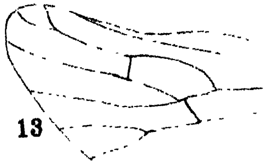
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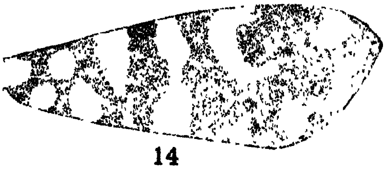
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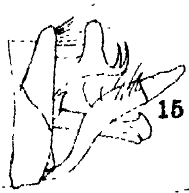
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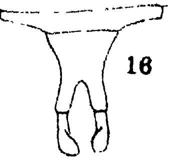
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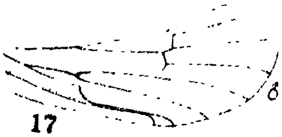
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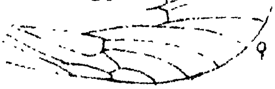
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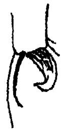
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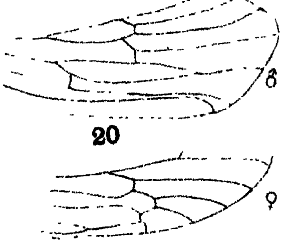
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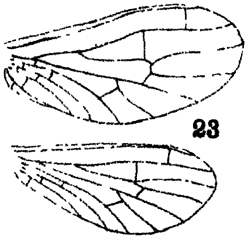
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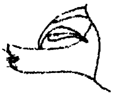
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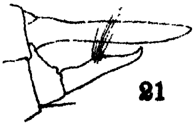
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XXXIX. A NEW MALAYAN MEMBRACID.

By W. D. FUNKHOUSER,

University of Kentucky.

(With one text figure).

Through the courtesy of Mr. H. M. Pendlebury of the Selangor Museum at Kuala Lumpur, Federated Malay States, the writer has been permitted to examine a considerable collection of Membracidæ taken in various parts of the Malay Peninsula.

In this collection a new species is represented which may be described as follows:

Centrotoscelus maculipennis sp. nov. (Fig. 1).

Small, black, punctate, pubescent; eyes white; legs yellow; posterior process short, tectiform, not reaching tip of abdomen; tegmina brown with a broad hyaline band across the centre, no suprahumerals; scutellum distinct; posterior trochanters armed with teeth.

Head subquadrate, wider than long, finely punctate, densely pubescent with short golden hairs; eyes large, prominent, white; ocelli large, conspicuous, glassy, twice as far from each other as from the eyes and situated well above a line drawn through centers of eyes; clypeus subquadrate, nearly as wide as long, extending for half its length below inferior margins of genæ, tip rounded and pilose.

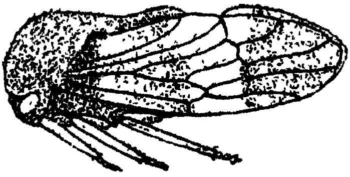

Fig. 1. *Centrotoscelus maculipennis* Funkhouser.

Pronotum black, finely punctate, densely pubescent with long golden hairs; no suprahumeral horns; metopidium sloping, wider than high; humeral angles prominent, triangular, blunt; median carina obsolete; posterior process short, heavy, blunt, tectiform, elevated in the middle, tip not reaching the end of the abdomen and only about to the middle of the tegmina; scutellum distinctly exposed on each side.

Tegmina long, narrow, brown with a broad hyaline fascia across the middle; base brown, coriaceous and punctate; veins weak, indistinct, punctate and pilose; five apical and three discoidal cells; limbus very narrow. Hind wings with three apical areas.

Sides of thorax and undersurface of body brown; femora brown; tibiæ and tarsi yellow; hind trochanters armed with teeth on inner margin.

Length from front of head to tips of tegmina 4.7 mm.; width between tips of humeral angles 2.1 mm.

Type: male.

Described from six males and one female. The female and two of the males were taken on Fraser's Hill at elevations ranging from 3,700 to 4,000 feet in February 1929 and May 1931 and the other two males were taken on Larut Hill at an elevation of 4,000 feet on February 11, 1932. Both of these localities are in the Federated Malay States. All specimens collected by Mr. H. M. Pendlebury.

Type, allotype and two paratypes in F. M. S. Museum collection; two paratypes in author's collection.

The writer is greatly indebted to Mr. Pendlebury, not only for the privilege of studying this material, but for the many courtesies shown him and the gracious hospitality extended to him on the occasion of his three weeks stay in Kuala Lumpur during the winter of 1933.

XL. CERAMBYCIDÆ FROM MOUNT KINABALU.

By W. S. FISHER,

Bureau of Entomology and Plant Quarantine,
United States Department of Agriculture,
Washington, D. C.

Through the courtesy of Mr. H. M. Pendlebury, Systematic Entomologist of the Federated Malay States Museums at Kuala Lumpur, the writer has been permitted to study a collection of Cerambycid beetles collected on an expedition to Mount Kinabalu in British North Borneo, during March, April, and May, 1929. Eighty-seven species are represented in the collection, of which seven genera and thirty-eight species are herein described as new.

All of the specimens were collected by Mr. Pendlebury and my sincere thanks are extended to him for his kindness in permitting me to deposit the types of all the new species in the United States National Museum at Washington. Paratypes, except where species are described from uniques, are placed in the Selangor Museum at Kuala Lumpur, Federated Malay States.

A valuable account of this expedition is given by Messrs. Pendlebury and Chasen in the Journal of the Federated Malay States Museums (Vol. XVII, 1932, pp. 1–38, pls. 1–VIII, frontispiece, map).

Subfamily PRIONINAE.

1. **Parandra janus** Bates.

Mount Kinabalu: Kiau—Tenompok Pass, 3,000–4,700 feet, March 18, 1929, one specimen; Lumu Lumu, 5,500 feet, April, 15, 1929, one specimen.

2. **Megopis (Aegosoma) suturalis** sp. n.

Female.—Narrowly elongate, subcylindrical, subopaque; head, antennæ, and pronotum reddish-brown, except the outer joints of the antennæ, and margins of the pronotum, which are black; scutellum brownish-black; elytra pale yellowish-brown, with the base, and lateral and sutural margins of each elytron, black, except toward apex; beneath reddish or yellowish-brown, with the tarsi, tibiæ, and apical halves of the femora black.

Head with the front short, strongly transverse, broadly concave between the antennal tubercles, with a narrow, longitudinal groove extending from epistoma to occiput; surface finely, densely granulose, with a few coarser granules intermixed, sparsely clothed with short, recumbent, yellowish hairs. Antenna two-thirds as long as the body, coarsely rugose or scabrous, not ciliate beneath; third joint nearly three times as long as the first and subequal in length to the fourth and fifth joints united. Eyes deeply emarginate, the lower lobe distant from base of mandible.

Pronotum strongly transverse, slightly narrower at apex than at base; sides subparallel, unarmed, strongly constricted near apical and posterior angles, posterior angles broadly rounded, the lateral margin distinct only from the basal margin to the outer angle of the anterior coxal cavity, and completely obliterated in front; disk moderately convex, broadly, transversely depressed along base; surface finely, densely granulose, more or less finely rugose, sparsely clothed with short, recumbent, yellow hairs. Scutellum elongate, longitudinally concave, acutely rounded at apex, the surface finely, irregularly rugose, and sparsely clothed with short, inconspicuous, semierect hairs.

Elytra distinctly wider than pronotum, and three and one-half times as long as wide; sides parallel from base to near the tips, which are conjointly broadly rounded, and each elytron furnished with a distinct spine at sutural angle: surface rather densely, coarsely, uniformly punctate, with numerous small, shining granules, and a few obsolete, longitudinal costæ.

Body beneath finely, sparsely punctate, more or less granulose; metasternum rather densely clothed with long, erect, yellowish hairs. Abdomen sparsely clothed with short, recumbent, inconspicuous hairs; fifth ventral segment broadly, arcuately emarginate at apex; ovipositor broad at base, narrow and subcylindrical toward the apex.

Length, 34 millimeters; width, 7 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from a single female collected at an altitude of 3,000 feet, April 4, 1929. This species is related to *marginalis* Fabricius, but it differs from that species in being more slender and subcylindrical, and in having the outer joints of the antennæ black, the pronotum transversely concave along the apical margin, with the sides strongly sinuate, the legs black, and the elytra without distinct costæ, but each furnished with a distinct spine at the sutural angle.

3. **Megopis (Aegosoma) gigantea** Lansberge.

Mount Kinabalu: Kenokok, 3,300 feet, April 25, 1929, one specimen; Kiau, 3,000 feet, April 11, 1929, one specimen; Lumu Lumu, 5,500 feet, April 7, 1929, one specimen.

4. **Hystatus javanus** Thomson.

Mount Kinabalu: Kiau, 3,000 feet, May 3, 1929, one specimen.

5. **Priotyrannus (Kinibalua) megalops** Bates.

Kabayau, near Mount Kinabalu, 600 feet, May 12, 1929, one specimen.

6. Genus **Neosarmydus** gen. n.

Head rather large; antennal tubercles normal, divergent, and rather widely separated; epistoma transverse, concave, without transverse swellings; eyes large, feebly emarginate, narrowly separated above, partially encircling the bases of antennæ; maxillary palpus longer than labial palpus, the last joint narrowly rectangular and truncate at apex; mandibles short, robust, pluridentate on inner sides. Antenna 10-jointed, slightly longer than the body, joints three to ten subcylindrical, finely, densely granulose and longitudinally striate, but the joints not angulose or spinose at apices; first joint robust, longer than wide, arcuate, flattened beneath; third joint twice as long as the first and slightly longer than the fourth, the following joints gradually decreasing in length to the tenth, which is twice as long as the ninth. Pronotum strongly transverse, narrower than the elytra, uneven above, armed on each side at middle with two long spines, which are joined at the base, the posterior spine longer than the anterior one. Elytra longitudinally costate. Legs moderately long; femora slender, feebly flattened, sides nearly parallel, the posterior pair not extending to tip of abdomen; tibiæ not carinate; tarsus normal, the third joint deeply emarginate. Body rather narrowly elongate.

Genotype.—*Neosarmydus costipennis* sp. n.

This genus belongs to the tribe Prionini and is related to *Emphiesmenus* Lansberge, but it differs from that genus in being more slender, and in having the pronotum armed on each side with only two distinct teeth, the elytra longitudinally costate, and the antennæ composed of ten joints. It also resembles *Sarmydus* Pascoe, but it differs from that genus in having the antennæ composed of ten joints.

Neosarmydus costipennis sp. n.

Narrowly elongate, strongly flattened above, subopaque, uniformly reddish-brown above and beneath.

Head with the front broadly concave, strongly, angularly depressed between the antennal tubercles, with a narrow, longitudinal groove extending from occiput to middle of front; surface coarsely, irregularly, confluently rugose or punctate, clothed with a few fine, erect hairs; eyes very narrowly separated above; antenna with first two joints coarsely punctate and slightly pubescent, the following joints very finely, densely granulose and longitudinally striate.

Pronotum twice as wide as long, subequal in width at base and apex, widest at middle; sides obliquely narrowed from lateral spines toward base and apex; disk uneven, with a V-shaped elevation at middle; surface coarsely, irregularly, confluently punctate or rugose, sparsely clothed with long, erect, fine, yellowish hairs. Scutellum subtriangular, broadly rounded at apex, concave, sparsely clothed with long, erect, yellowish hairs.

Elytra two and one-half times as long as wide, at base distinctly wider than pronotum, widest at middle; humeri strongly developed; sides nearly parallel, feebly expanded at middle, with the tips conjointly broadly rounded; surface inconspicuously granulose, rather densely, coarsely, irregularly punctate, more or less rugose, nearly glabrous, except along sutural and lateral margins, which are distinctly elevated, and each elytron with two longitudinal costæ extending from base to behind the middle.

Abdomen beneath obsoletely granulose, finely, densely scabrous, rather densely clothed with moderately long, semierect, fine, yellowish hairs; last segment broadly rounded at apex. Metasternum densely clothed with very long, erect, fine, yellowish hairs.

Length, 23–27 millimeters; width, 8–9 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from two specimens (one type) collected at the type locality at an altitude of 5,500 feet. The type was collected April 8, 1929, and the paratype April 17, 1929.

7. **Dorysthenes (Paraphrus) planicollis** Bates.

Mount Kinabalu: Lumu Lumu, 5,500 feet, April 10, 1929, two specimens; Koung, near Mount Kinabalu, 1,300 feet, March 15, 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 12, 1929, one specimen.

8. **Sarmydus antennatus** Pascoe.

Mount Kinabalu: Kiau, 3,000 feet, March 25–28, 1929, four specimens.

Subfamily CERAMBYCINÆ.

9. Genus **Eburiomorpha** gen. n.

Head not prominent, not covered by the prothorax, short in front; antennal tubercles not prominent, depressed; ligula corneous; mandibles short, acute at tips; maxillary palpus longer than labial palpus, the last joint narrowly elongate, subcylindrical, truncate at apex; eyes large, coarsely granulated, deeply emarginate, widely separated above. Antenna 11-jointed, slender, feebly ciliate beneath, not spinose, nearly as long as the body (female); first joint robust, subcylindrical, expanded toward apex, twice as long as wide; third joint twice as long as first and longer than the following joints, these gradually decreasing in length to the eleventh, which is slightly longer than the tenth. Pronotum transverse, narrower than elytra, emarginate at posterior angles, dilated and feebly tuberculate on each side. Elytra with eburneous spots. Legs moderately long; femora slender, feebly flattened, sides nearly parallel, the posterior pair extending to apical margin of third abdominal segment; anterior coxæ strongly angulated externally; middle coxal cavities open externally. Prosternal process broad between anterior coxæ. Abdominal segments subequal in length. Body broadly elongate.

Genotype.—*Eburiomorpha guttata* sp. n.

This genus belongs to the tribe Oemini and is related to *Noscrius* Pascoe, but it differs from that genus in having the anterior coxæ rather widely separated, the last joints of the palpi subcylindrical, and the head shorter and more horizontal in front.

Eburiomorpha guttata sp. n.

Female.—Broadly elongate, moderately convex, subopaque, uniformly pale brownish-yellow above and beneath, and each elytron ornamented with four elongate, eburneous spots.

Head with the front very short, feebly, broadly concave between the antennal tubercles, which are widely separated, with a shallow, median depression behind the eyes, and a vague, narrow, longitudinal carina between the antennal tubercles; surface finely, densely punctate, with a few coarse punctures intermixed, rather densely clothed with short, recumbent, yellowish pubescence; eyes separated from each other on the top by about three times the width of the upper lobe. Antenna finely, densely punctate (coarser on basal joint), and sparsely clothed with short, recumbent, yellowish pubescence, with a few long, erect hairs intermixed.

Pronotum one and two-thirds times as wide as long, subequal in width at base and apex, widest at middle; sides arcuately rounded, feebly, narrowly constricted at base, and armed on each side at middle with a short, obtuse tubercle; disk slightly uneven, feebly, transversely depressed along base and anterior margin; surface finely, densely punctate, with a few coarser punctures intermixed, rather densely clothed with very short, recumbent, yellowish-white pubescence, with numerous longer, erect hairs intermixed. Scutellum transverse, subtruncate at apex, densely clothed with semierect, whitish pubescence.

Elytra six times as long as pronotum, and at base distinctly wider than pronotum; humeri feebly developed; humeral angles obtusely rounded; sides parallel from base to apical sixth, then arcuately narrowed to the tips, which are feebly, arcuately emarginate, and each furnished with a long, acute spine at sutural angle; disk even, moderately convex; surface rather densely, coarsely, uniformly punctate, intervals densely, minutely punctate, densely, uniformly clothed with very short, recumbent, and longer, erect, inconspicuous hairs intermixed, each elytron with two very indistinct, longitudinal costæ, and ornamented with two pairs of contiguous, oblong, eburneous spots, one pair at base, the other at the middle.

Body beneath finely, densely punctate, densely clothed with long, recumbent and erect, whitish hairs, the hairs denser on the mesosternum; last abdominal segment broadly rounded and feebly emarginate at apex.

Length, 28 millimeters; width, 8 millimeters.

Type locality.—Mount Kinabalu: Marei Parei.

Described from a single female collected at an altitude of 5,000 feet, April 30, 1929.

10. **Dymasius acutipennis** sp. n.

Female.—Rather narrowly elongate, slightly flattened above, feebly shining, dark reddish-brown the legs and antennæ slightly paler, and the elytra clothed with silky pubescence.

Head with the front strongly transverse, uneven, deeply, longitudinally depressed between the antennal tubercles and upper lobes of eyes, with two large, deep depressions on the front, and a narrow, longitudinal carina in the depression between the antennal tubercles, which are prominent and divergent; surface sparsely, irregularly punctate anteriorly, impunctate on median part, with numerous short, transverse rugæ on occiput, sparsely, irregularly clothed with long, recumbent, yellowish pubescence. Eyes large, coarsely granulated, deeply emarginate, and narrowly separated on the top. Antenna about as long as the body, not ciliate beneath, rather densely pubescent, joints three and four cylindrical, slightly expanded at apices, joint five to eleven flattened on outer margin, with the apices acutely angulated; first joint robust, feebly expanded toward apex, twice as long as wide, subequal in length to the third joint, which is slightly longer than the fourth.

Pronotum longer than wide, slightly narrower at apex than at base, widest near middle; sides feebly rounded, slightly constricted near apical angles, unarmed; disk moderately convex, feebly, broadly, transversely flattened along anterior margin, narrowly, transversely grooved along base, and very coarsely, deeply, irregularly rugose or corrugated on the median part; surface impunctate, sparsely, irregularly clothed with long, recumbent, yellow pubescence on the median part, the pubescence denser toward the sides and concealing the surface. Scutellum triangular, narrowly subtruncate at apex, sparsely clothed with recumbent, yellow pubescence.

Elytra four times as long as pronotum, considerably wider than pronotum at base; sides nearly parallel from base to near the tips, then arcuately narrowed to the sutural margins, which are acutely produced into a short spine; disk feebly flattened; surface finely, sparsely punctate, with a few coarse punctures intermixed, rather densely clothed with moderately long, recumbent, silky, brownish-white pubescence.

Body beneath densely, indistinctly punctate, densely, uniformly clothed with long, recumbent, brownish-white pubescence; last abdominal segment broadly rounded at apex; posterior tibiæ straight.

Length, 22 millimeters; width, 5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single female collected at an altitude of 5,500 feet, April 16, 1929. This species is allied to *amictus* Pascoe, but it differs from that species in being narrower, and in having the outer joints of the antennæ more strongly flattened and the third joint distinctly longer than the fourth, the elytra acutely produced at the sutural margins, and the surface uniformly clothed with silky, brownish-white pubescence.

11. **Ceresium zeylanicum** White.

Mount Kinabalu: Kiau, 3,000 feet, March 29, 1929, one specimen.

12. **Ceresium pachymerum** Pascoe.

Mount Kinabalu: Kiau, 3,000 feet, March 29, 1929, one specimen.

13. **Ceresium femoratum** Aurivillius.

Mount Kinabalu: Kiau, 3,000 feet, March 27, 1929, one specimen.

14. **Strangalia baluensis** sp. n.

Narrowly elongate, strongly attenuate posteriorly, strongly flattened above, subopaque, black above and beneath, except for a spot on under side of head, part of the coxæ, and the outer joints of the antennæ, white

or yellow, and each elytron ornamented with an obsolete, longitudinal, short, pale yellow vitta behind the humerus, the vitta turned inward along the base, and a similar vitta extending along sutural margin from apical fourth to apex.

Head with the front transverse, flat, slightly uneven, feebly depressed between the antennal tubercles, strongly, abruptly, transversely depressed behind the eyes, with a narrow, longitudinal groove extending from epistoma to occiput; surface densely, finely, irregularly punctate, with a few coarser punctures intermixed on the occiput, sparsely clothed with semierect, yellowish-white pubescence. Eyes large, oblong, finely granulated, feebly emarginate. Antenna three fourths as long as body; first joint elongate, cylindrical, slightly arcuate, subequal in length to the fourth joint, which is distinctly shorter than the third.

Pronotum campanulate, slightly longer than wide; sides strongly, obliquely expanded from apex to base, feebly constricted at apex and behind middle; disk strongly convex, strongly, broadly, transversely flattened along anterior margin, feebly, transversely depressed along base; surface with a narrow, longitudinal, median, smooth carina, rather coarsely, confluently punctate, sparsely clothed with long, recumbent, yellowish-white pubescence. Scutellum elongate, narrowly rounded at apex, rather densely clothed with recumbent, yellowish-white pubescence.

Elytra wider than pronotum at base; humeral angles broadly rounded; sides strongly, obliquely narrowed from base to tips, which are separately obliquely subtruncate, and furnished with a short spine at sutural and external angles; disk strongly flattened, feebly depressed at base near humeri; surface finely, rather densely, but not deeply, punctate, sparsely clothed on exterior halves with long, recumbent, black pubescence, and each elytron densely clothed on interior half with a broad, longitudinal vitta composed of long, transversely recumbent, silky, yellowish-white pubescence, the vitta expanded near the base and enclosing an oblong, black, pubescent spot.

Body beneath finely, densely punctate, rather densely clothed with long, recumbent, silky, yellowish-white pubescence; last abdominal segment broad, deeply concave near the apex, which is transversely truncate.

Length, 18 millimeters; width, 3.75 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single female collected at an altitude of 5,500 feet, April 12, 1929. This species is closely allied to *flavovittata* Aurivillius, but it differs from the description given for that species in being larger, and in having the antennal joints uniformly coloured (not paler at bases), the elytra with inconspicuous, yellow vittæ, and the yellowish-white, pubescent vitta on each elytron enclosing an oblong, black pubescent spot near the base. Under this species is placed another specimen collected at Kamborangah, Mount Kinabalu, at an altitude of 7,200 feet, March 26, 1929. It differs from the type in being uniformly black, and in having the tips of the elytra a little more obliquely truncate, the last ventral segment of the abdomen triangularly depressed, and more broadly truncate at apex, with the angles slightly produced, and the pubescent vittæ on the elytra not conspicuous.

15. **Coloborhombus intermedius** Gahan.

Mount Kinabalu: Lumu Lumu, 5,500 feet, April 10, 1929, one specimen.

16. **Pachyteria ruficollis** Waterhouse.

Mount Kinabalu: Kiau, 3,000 feet, April 12–16, 1929, five specimens.

17. **Rosalia (Eurybatus) borneensis** Rothschild and Jordan.

Mount Kinabalu: Tenompok Pass—Kiau, 4,700—3,000 feet, April 19, 1929, one specimen; Kiau—Tenompok Pass, 3,000—4,700 feet, March 18, 1929, two specimens.

18. **Chlorophorus annularis** Fabricius.

Mount Kinabalu: Kiau, 3,000 feet, March 16—April 20, 1929, nine specimens; Kabayau, near Mount Kinabalu, 600 feet, May 12, 1929, one specimen.

19. **Chlorophorus borneensis** sp. n.

Elongate, moderately robust, uniformly black above and beneath, the elytra ornamented with whitish pubescent designs.

Head with the front elongate, narrow, distinctly elevated on each side between the antennæ, with a narrow, longitudinal carina extending from epistoma to occiput; surface coarsely, rather densely, irregularly punctate, sparsely clothed with rather long, recumbent, whitish hairs. Antenna about one-half as long as body, unarmed, finely, sparsely punctate, sparsely clothed with recumbent, whitish pubescence; first joint subequal in length to the third.

Pronotum globose, as wide as long, equal in width at base and apex, widest at middle; sides strongly, arcuately rounded; disk evenly, strongly convex, with a narrow, transverse groove along base and apical margin; surface uniformly, confluently foveolate, with a long, semierect, whitish hair arising from the middle of each fovea, except on the median part, where the hairs are black and inconspicuous. Scutellum strongly transverse, broadly rounded at apex, densely clothed with long, recumbent, whitish pubescence.

Elytra two and two-thirds times as long as pronotum, at base as wide as pronotum at middle; sides parallel from base to near the tips, which are separately broadly, obliquely truncate, with a short tooth at the outer angle; surface densely, finely punctate, densely clothed with long, recumbent, brown pubescence, and each elytron ornamented with long, recumbent, whitish pubescence as follows: A short, transverse fascia at base near scutellum, a triangular spot on disk at basal fourth extending to sutural margin but not to the lateral margin, a narrow, transverse fascia at middle extending from lateral margin to sutural margin, then forward along sutural margin to the triangular spot, and a large spot covering the apical fourth.

Body beneath densely clothed with long, recumbent, whitish pubescence; last abdominal segment broadly rounded at apex; middle and posterior femora longitudinally carinate.

Length, 10 millimeters; width, 2.5 millimeters.

Type locality.—Mount Kinabalu: between Kiau and Tenompok.

Described from a single specimen collected at an altitude of 3,000 to 4,700 feet, April 19, 1929. This species resembles *manillæ* Aurivillius, but it differs from that species in having the pronotum foveolate, the tips of the elytra obliquely truncate, and the transverse, median pubescent fascia on each elytron extending forward along the sutural margin to the anterior triangular, pubescent spot.

20. **Rhaphuma atrata** sp. n.

Small, narrowly elongate, feebly shining, uniformly brownish-black above and beneath, antenna slightly paler, and the elytra ornamented with transverse, white pubescent fasciæ.

Head with the front longer than wide, flat, sides parallel, feebly, obliquely elevated on each side between the antennæ, which are rather widely separated, with a narrow, longitudinal carina on the front; surface sparsely, but not deeply, irregularly punctate, sparsely, irregularly clothed with long, recumbent, whitish hairs. Antenna about one-half as long as body, unarmed, finely, densely punctate, sparsely clothed with short, recumbent, whitish pubescence, with a few long hairs on the underside; first joint robust, subglobose, subequal in length to the fourth joint, which is nearly twice as long as the third.

Pronotum globose, longer than wide, equal in width at base and apex, widest at middle; sides strongly, arcuately rounded, slightly constricted at base; disk evenly, strongly convex; surface rather densely, irregularly, transversely rugose on disk, the rugæ more or less interrupted, becoming obsolete toward the sides, sparsely clothed with short, fine, inconspicuous, brown hairs on the disk, nearly glabrous toward the sides, and ornamented along base with a narrow fascia of long, dense, recumbent, white pubescence. Scutellum as wide as long, broadly rounded at apex, clothed with a few brown hairs.

Elytra three times as long as pronotum, and wider than pronotum at middle; sides parallel from base to near the tips, which are separately broadly, transversely truncate; surface finely, densely punctate, or feebly, irregularly rugose, rather densely clothed with long, recumbent, inconspicuous, brown hairs, and each elytron ornamented with dense, long, recumbent, white pubescence as follows: A narrow, transverse fascia at basal third, the fascia slightly oblique and extending from sutural margin to lateral declivity, a narrow, transverse fascia just behind the middle, the fascia slightly wider at sutural margin, the sides converging to near, but not reaching, the lateral margin, and a narrow, transverse fascia at apex.

Body beneath finely, sparsely punctate, sparsely clothed with fine, recumbent, whitish pubescence, and ornamented with dense, white pubescence as follows: A broad, transverse fascia along posterior margin on each side of first abdominal segment, a large spot on the posterior part of the metasternal epimeron, a small spot at exterior angle on posterior part of metasternum, and a large spot on the mesosternal epimeron; last abdominal segment broadly rounded at apex. Legs with numerous long, erect spines or stiff hairs; posterior pair very long, and the first tarsal joint twice as long as the following three joints united.

Length, 5.25 millimeters; width, 1.34 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from a single female collected at an altitude of 3,000 feet, March 17, 1929. This species resembles *Demonax ater* Aurivillius, but it differs from that species in having the antennæ unarmed, the anterior pubescent fascia on each elytron longer and more transversely oblique, and the elytra without long, erect hairs.

21. **Demonax borneensis** sp. n.

Elongate, moderately robust, uniformly brownish-black above and beneath, the elytra ornamented with whitish pubescent designs.

Head with the front elongate, flat, sides feebly, arcuately constricted, distinctly, obliquely elevated on each side between the antennæ, which are not very widely separated, with a distinct, longitudinal carina extending from epistoma to occiput; surface rather finely, densely punctate, rather densely clothed with long, recumbent, whitish pubescence. Antenna about three fourths as long as the body, densely clothed with short, recumbent, whitish pubescence, basal joints sparsely ciliate beneath, and joints three and four armed with a long spine at apices; first joint robust, subcylindrical, slightly arcuate, subequal in length to the fourth joint, which is slightly shorter than the third.

Pronotum globose, longer than wide, equal in width at base and apex, widest at middle; sides moderately, arcuately rounded, feebly constricted at base; disk evenly, strongly convex, feebly, narrowly, transversely depressed along base; surface irregularly, but not deeply, confluently foveolate, rather densely clothed with short, recumbent, whitish hairs, which are more or less grouped into series of three to five, and with a small, vague, elongate, dark spot at middle. Scutellum elongate triangular, rather acutely rounded at apex, densely clothed with short, whitish pubescence.

Elytra three times as long as pronotum, and wider than pronotum at middle; sides nearly parallel from base to near the tips, which are separately broadly, transversely sinuate, and furnished with a short tooth at the sutural and lateral angles; surface finely, densely punctate, densely clothed with recumbent, brown pubescence, and each elytron ornamented with dense, whitish pubescence as follows: An elongate post-humeral vitta connected to a transverse fascia along base, a rounded spot on disk just in front of middle, connected to a narrow vitta extending along sutural margin to basal fascia, a triangular fascia behind middle, widest at sutural margin, with the sides converging to near the lateral margin, and a broad vitta (arcuately constricted externally near apex) extending along sutural margin from apical fourth to apex.

Body beneath densely, uniformly clothed with moderately long, recumbent, whitish pubescence, which nearly conceals the surface; last abdominal segment broadly rounded at apex. Legs with numerous long, erect spines or stiff hairs; posterior pair long, the femora extending beyond apex of elytron, and the first tarsal joint twice as long as the following three joints united.

Length, 11 millimeters; width, 2.5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single female collected at an altitude of 5,500 feet, April 9, 1929. This species resembles *detortus* Pascoe, but it differs from that species in having the pronotum longer than wide, with only one median dark spot, and with the apical whitish pubescent spot on each elytron covering the sutural half of the apical fourth.

22. **Demonax pendleburyi** sp. n.

Narrowly elongate, subcylindrical, uniformly brownish-black above and beneath, the elytra densely clothed with whitish pubescence, and vaguely ornamented with brownish-yellow pubescent fasciæ.

Head with the front transverse, flat, sides feebly, arcuately constricted, distinctly, obliquely elevated on each side between the antennæ, which are not very widely separated, with a distinct, longitudinal carina extending from epistoma to occiput, finely, densely punctate on front, coarsely, irregularly punctate on occiput, densely clothed with long, recumbent, whitish pubescence, which nearly conceals the surface. Antenna three fourths as long as body, densely clothed with short, recumbent, whitish pubescence, basal joints sparsely ciliate beneath, joint three and four armed with a long spine at apices, and joint five with a short spine at apex; first joint robust, subcylindrical, slightly shorter than third joint, which is subequal in length to the fourth.

Pronotum subcylindrical, distinctly longer than wide, equal in width at base and apex, widest at middle; sides feebly arcuately rounded, slightly constricted at base; disk strongly convex, feebly, longitudinally gibbose behind middle, narrowly, transversely depressed along base; surface irregularly, but not deeply, confluently foveolate, with a few scattered, coarse punctures toward base, densely, uniformly clothed with short, recumbent, whitish hairs, which are more or less grouped into series of three to five hairs, and with a few fine, erect hairs intermixed. Scutellum elongate triangular, acute at apex, rather densely clothed with recumbent, whitish pubescence.

Elytra three times as long as pronotum, and wider than pronotum at middle; sides parallel from base to near the tips, which are separately broadly, obliquely rounded, and furnished with a short tooth at lateral angle; surface finely, densely punctate, with a few coarse punctures intermixed, densely clothed with long, recumbent, whitish pubescence, which conceals the surface, with a few erect hairs intermixed, and each elytron ornamented with inconspicuous, brownish-yellow pubescence as follows: A broad, irregular, transverse spot behind the humerus, but not reaching the sutural margin, a narrow, transverse fascia extending obliquely backward from the sutural margin at middle, then forward along lateral margin for a short distance, and a transverse fascia at apical fourth extending from sutural margin to lateral margin, then backward along the margin to apex.

Body beneath densely, uniformly clothed with recumbent, whitish pubescence, with a few erect hairs intermixed, the pubescence nearly concealing the surface; last abdominal segment broadly rounded at apex. Legs with numerous long, erect spines or stiff hairs; posterior pair long, the femora extending beyond the apex of elytron, and the first tarsal joint twice as long as the following joints united.

Length, 14 millimeters; width, 2.75 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single female collected at an altitude of 5,500 feet, April 9, 1929. This species can be separated from the other known species of this genus found in Borneo by its long, narrow, and subcylindrical form, and in having the upper surface densely clothed with whitish pubescence, and the elytra ornamented with inconspicuous, brownish-yellow pubescent fasciæ.

23. **Euryphagus lundi** var. **nigripes** Olivier.

Mount Kinabalu: Kiau, 3,000 feet, April 24, 1929, one specimen.

Subfamily LAMIINÆ.

24. Genus **Anxylotoles** gen. n.

Head prominent, front vertical and subquadrate; epistoma distinct; mandibles short, acute at tips; antennal tubercles depressed, not prominent; palpi subequal in length, last joints cylindrical, acute at apices; cheeks moderately long. Antenna 11-jointed, shorter than body, slender, not ciliate beneath, unarmed, but joints three to eleven furnished with elongate sensory foveæ; first joint robust, oval, twice as long as wide, feebly emarginate beneath at base, three fourths as long as third joint, which is slightly longer than the fourth, the following joints gradually decreasing in length. Eyes small, coarsely granulated, rather deeply emarginate, widely separated on the top. Pronotum slightly wider than long, unarmed at the sides. Elytra elongate, convex, strongly attenuate posteriorly, apices strongly divaricate, without distinct humeri. Legs rather short; femora robust, slightly expanded near middle, the posterior pair shorter than abdomen; intermediate tibiæ grooved; anterior coxæ globose; middle coxal cavities open externally. Prosternal process rather narrow, convex, expanded posteriorly. Intercoxal process of abdomen acute at apex. Body elongate, finely pubescent, wingless.

Genotype.—*Anxylotoles caudatus* sp. n.

This genus belongs to the tribe Dorcadionini and is related to *Xylotoles* Newman, but it differs from that genus in having the antenna shorter than the body, not ciliate beneath, but the outer joints furnished with sensory foveæ, the pronotum not longer than wide, the prosternal process arcuately elevated between the anterior coxæ, and the femora only slightly expanded.

Anxylotoles caudatus sp. n.

Narrowly elongate, slightly flattened above, subopaque, brownish-black, except the antennæ, elytra, and tibiæ (except at apices), which are reddish-brown.

Head with the front slightly convex, feebly, broadly concave between the antennal tubercles, with a narrow, longitudinal groove extending from epistoma to occiput; surface coarsely, deeply, irregularly punctate, more confluently punctate on vertex and occiput, sparsely clothed with short, recumbent, inconspicuous hairs; eyes separated from each other on the top by five times the width of the upper lobe. Antenna sparsely clothed with short, recumbent, inconspicuous pubescence, with a few longer, erect hairs intermixed.

Pronotum slightly wider than long, subequal in width at base and apex, widest just behind middle; sides arcuately rounded, feebly constricted at base; disk moderately convex, feebly, broadly, transversely flattened on apical third and along base; surface coarsely, deeply, uniformly, confluently punctate, very sparsely clothed with short, recumbent, inconspicuous hairs. Scutellum transverse, broadly rounded at apex, densely clothed with short, recumbent, whitish pubescence.

Elytra three and one half times as long as pronotum, at base subequal in width to pronotum at middle, widest near middle; humeral angles nearly rectangular; sides moderately, arcuately rounded from base to the tips, which are strongly divaricate, acute, and directed slightly upward; disk slightly flattened on basal two thirds, with the sides vertical, strongly, obliquely declivous from sutural margin to lateral margin on apical third; surface very coarsely, deeply, irregularly foveolate, sparsely clothed with very short, recumbent, inconspicuous hairs.

Body beneath finely, densely punctate, with a few coarse punctures intermixed, densely, uniformly clothed with short, recumbent, inconspicuous, whitish pubescence; last abdominal segment broadly rounded, and feebly emarginate at apex.

Length, 9.5–10 millimeters; width, 2.4–2.5 millimeters.

Type locality.—Mount Kinabalu: Pakka.

Described from two specimens (one type) collected at the type locality at an altitude of 10,000 feet, March 23, 1929.

25. **Anexodus kuntzeni** Kriesche.

Mount Kinabalu: Tenompok Pass, 4,500 feet, April 18, 1929, one specimen.

26. **Trachystola granulata** Pascoe.

Mount Kinabalu: Kiau, 3,000 feet, April 8, 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 9–11, 1929, two specimens.

27. **Trachystola puncticollis** sp. n.

Narrowly elongate, moderately convex above, opaque, uniformly brownish-black above and beneath, except the outer nine antennal joints, which have the basal halves brownish-yellow.

Head with the front slightly longer than wide, nearly flat, the sides parallel; antennal tubercles prominent, contiguous at bases, and obliquely divergent; surface coarsely punctate, the punctures deep and more or less confluent, sparsely clothed with short, recumbent, brownish hairs, with a narrow, feeble, longitudinal groove on the occiput. Eyes coarsely granulated, deeply emarginate, separated from each other on the top by twice the width of the upper lobe, the lower lobe twice as long as wide. Antenna slightly longer than the body, not ciliate beneath; first joint robust, slightly arcuate, gradually expanded to apex, with an open cicatrix at apex, subequal in length to the fourth joint, which is slightly shorter than the third.

Pronotum slightly wider than long, equal in width at base and apex; sides nearly parallel, strongly constricted at anterior margin, apical third, and behind middle, and armed on each side at middle with a short, acute tooth, which is directed obliquely upward; disk moderately convex, broadly, transversely flattened along base, with two narrow, transverse grooves on each side behind apical margin, but the grooves not extending on median part; surface coarsely, deeply, irregularly punctate, sparsely clothed with very short, recumbent, inconspicuous hairs. Scutellum transverse, subtruncate at apex, concave, sparsely clothed with recumbent, yellowish pubescence.

Elytra distinctly wider than pronotum at base, and moderately convex; sides nearly parallel from base to apical fourth, then arcuately narrowed to the tips, which are separately rather broadly rounded; surface coarsely, rather densely, irregularly punctate, sparsely clothed with very short, inconspicuous, recumbent hairs, and each elytron ornamented with numerous small elevations or tubercles, more or less arranged in irregular rows.

Body beneath finely, densely punctate (except prosternum, which is sparsely, coarsely punctate), and sparsely clothed with short, inconspicuous pubescence.

Length, 13–15 millimeters; width, 4.25–5.5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from three specimens (one type) collected at the type locality at an altitude of 5,500 feet, April 7–14, 1929. This species is related to *granulata* Pascoe, but it differs from that species in being smaller and more slender, and in having the pronotum coarsely punctured and without median tubercles, and the tubercles on the elytra rounded and not arranged in distinct, longitudinal rows.

28. **Epicedia maculatrix** Perty.

Mount Kinabalu: Kiau, 3,000 feet, March 25, 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 9, 1929, one specimen.

29. **Anhammus variegatus** sp. n.

Elongate, rather robust, strongly flattened above, subopaque, uniformly reddish-brown above and beneath.

Head with the front slightly transverse, nearly flat, the sides parallel, angularly concave between the antennal tubercles, which are prominent, contiguous at bases, and obliquely divergent; surface sparsely, coarsely, irregularly punctate, rather densely clothed with short, recumbent, brownish-yellow pubescence. Eyes coarsely granulated, deeply emarginate, the lower lobes about twice as long as wide. Antenna twice as long as the body, not ciliate beneath; first joint cylindrical, gradually expanded to apex, with a vague cicatrix at apex, three fifths as long as the third joint, the following joints each subequal in length to the third.

Pronotum strongly transverse, equal in width at base and apex; sides nearly parallel, armed on each side just in front of middle with a long tooth, which is broad at base, acute at apex, and directed obliquely upward; disk uneven at middle, broadly, transversely depressed along base and apex; surface rather densely, coarsely, irregularly punctate, densely clothed with moderately long, recumbent, brownish-yellow pubescence. Scutellum broadly triangular, broadly rounded or subtruncate at apex, densely clothed with recumbent, brownish-yellow pubescence.

Elytra four times as long as pronotum, distinctly wider than pronotum at base; humeral angles obtusely rounded, unarmed; sides feebly narrowed from base to apical fifth, then arcuately narrowed to the tips, which are separately broadly rounded; disk slightly convex, feebly, triangularly depressed behind scutellum, with a vague, longitudinal elevation at middle of each elytron behind base; surface rather densely, coarsely, irregularly punctate basally, the punctures becoming finer and more distant toward apices, with a few granules at base, and densely, irregularly variegated with short, recumbent, brownish-yellow pubescence.

Body beneath densely clothed with moderately long, recumbent, brownish-yellow pubescence; prosternum narrow between coxæ, arcuately declivous in front and behind; mesosternum arcuately declivous in front, with a vague, round elevation; middle coxal cavities open; anterior and middle tibiæ grooved.

Length, 15 millimeters; width, 4.5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single specimen collected at an altitude of 5,500 feet, April 7, 1929. This species differs from *Anhammus* in having the humeral angles unarmed, instead of armed with a distinct tooth, the elytra scarcely narrowed toward the apices, and the cicatrix on the first antennal joint scarcely visible. As, however, it belongs to the tribe Monochamini with declivous but not distinctly tuberculate mesosternum, with the lower lobes of the eyes longitudinal, not transverse, and with the pronotum armed on each side in front of the middle with a strongly developed acute spine, I do not hesitate in placing this species as a somewhat aberrant one in the genus *Anhammus* Thomson.

30. **Epepeotes luscus** Fabricius.

Mount Kinabalu: Kiau, 3,000 feet, May 2, 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 9, 1929, two specimens.

31. **Epepeotes gigas** Aurivillius.

Mount Kinabalu: Kenokok, 3,300 feet, April 26, 1929, one specimen.

32. **Epepeotes lateralis** Guérin.

Mount Kinabalu: Kiau, 3,000 feet, April 1–12, 1929, five specimens; Kamborangah, 3,000–4,000 feet, March 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 5, 1929, one specimen.

33. **Epepeotes vittipennis** sp. n.

Female.—Robust, attenuate posteriorly, moderately convex above, feebly shining, uniformly dark reddish-brown above and beneath, and each elytron ornamented with an irregular, longitudinal, white pubescent vitta along lateral margin.

Head with the front quadrate, slightly narrower at top than at bottom, triangularly depressed between the antennal tubercles, which are prominent, contiguous at bases, and strongly divergent; surface with a vague, longitudinal carina extending from epistoma to occiput, finely, densely punctate, densely clothed with long, recumbent, brownish-yellow pubescence, which conceals the surface. Eyes coarsely granulated, deeply emarginate, the lower lobes slightly longer than wide. Antenna one and one-fourth times as long as the body, not distinctly ciliate beneath, the outer joints indistinctly clothed with whitish pubescence on basal halves; first joint elongate, cylindrical, with a distinct, closed cicatrix at apex, slightly shorter than third joint, which is subequal in length to the fourth.

Pronotum strongly transverse, equal in width at base and apex; sides nearly parallel, constricted near base and behind middle, armed on each side at middle with a long, narrow tubercle, which is narrowly rounded at apex and directed obliquely upward; disk rather uneven, with a broad, transverse depression near anterior margin, three narrow, more or less distinct, transverse grooves behind the middle, and a short, transversely elevated (emarginate at middle) ridge at middle; surface finely, densely punctate, with a few coarse punctures intermixed, densely clothed with long, recumbent, brownish-yellow pubescence, which conceals the surface. Scutellum triangular, broadly rounded at apex, densely clothed with recumbent, brownish yellow pubescence.

Elytra five times as long as pronotum, nearly twice as wide as pronotum at base; humeri prominent, unarmed; sides obliquely narrowed from base to near the tips, which are separately broadly subtruncate, rounded at sutural margin, and acutely angulated at lateral margin; disk moderately convex; surface sparsely, irregularly punctate, the punctures coarse basally, but becoming obsolete toward apices, densely clothed with very short, grey pubescence, and each elytron ornamented near the lateral margin with a broad, irregular, longitudinal vitta composed of very dense, long, recumbent, white pubescence, the vitta extending from humerus to near apex, and constricted at middle and apical fourth.

Body beneath finely, densely punctate, rather densely, uniformly clothed with long, recumbent, brownish-yellow pubescence; last abdominal segment broadly subtruncate at apex; first joint of anterior tarsus not distinctly angulated on external side at the apex.

Length, 27 millimeters; width, 9 millimeters.

Type locality.—Mount Kinabalu: Kamborangah.

Described from two females (one type) collected at the type locality at altitude of 7,000 feet, March 19–31, 1929. This species is not quite typical of *Epepeotes* and differs slightly from the typical forms of this genus in having the eyes slightly longer than wide, and the first joint of the anterior tarsus of the female not distinctly angulated at the apex. It is distinguished from the other known species of this genus in having a broad, irregular, longitudinal, white pubescent vitta on each elytron.

34. Genus **Loxotropoides** gen. n.

Head large, obliquely inclined inward, triangularly concave between the antennæ, with the front very narrow and the sides parallel. Mandibles prominent, broad, arcuate, and acute at apices. Cheeks short. Palpi 3-jointed, subequal in length, the apical joints cylindrical and acutely pointed at apices. Antenna shorter than body, 11-jointed, not spinose, ciliate beneath; first joint subcylindrical, with a distinct, closed cicatrix, but not spinose at apex, slightly shorter than third joint. Antennal tubercles prominent, more or less contiguous, not spinose at apices. Eyes large, coarsely granulated, deeply emarginate, narrowly separated above, with the lower lobes subequilateral. Pronotum without lateral margins, transverse, armed with a sharp tubercle on each side. Scutellum broad, subtriangular. Elytra elongate, parallel, moderately convex, emarginate at apices. Abdominal segments unequal in length; three intermediate segments subequal in length, narrower than the first or fifth segments. Metasternum normal in length. Mesosternum truncate in front, strongly tuberculate. Prosternum short in front of anterior coxæ; prosternal process narrow between the coxæ, arcuately declivous in front and behind. Anterior coxæ large, subglobose, angulated externally, projecting beyond level of prosternal process, the cavities closed posteriorly. Intermediate coxal cavities open externally. Legs equal in length; tibiæ grooved, not tuberculate; femora feebly flattened, subcylindrical, slightly expanded at middle; posterior tarsus broad, with the first joint shorter than the following two joints united; tarsal claws simple, divaricate. Body robust, elongate, winged, finely pubescent.

Genotype.—*Loxotropoides brunnea* sp. n.

This genus belongs to the tribe Monochamini, and in the table given by Lacordaire (Genera des Coléoptères, tome IX, 1869, pp. 300–303) runs to *Pelargoderus* Serville, from which it differs in having the anterior tibiæ unarmed, the head very narrow and strongly, obliquely inclined in front, the antennæ ciliate beneath and shorter than the body, and the pronotum armed on each side with a distinct tubercle. It is also separated from most of the other genera of this tribe in having the front of the head very narrow and elongate.

Loxotropoides brunnea sp. n.

Elongate, robust, moderately convex above, subopaque, uniformly piceous above and beneath (except antennæ and tarsi), densely clothed with short, recumbent, brownish-white or brownish-yellow pubescence, but not concealing the punctures on the dorsal surface.

Head with the front flat, elongate, very narrow, the sides parallel at middle, but arcuately expanded near epistoma and antennal tubercles, densely punctate, with fine and coarse punctures intermixed, and with a distinct, longitudinal groove extending from epistoma to occiput; eyes separated from each other on the top by about the width of the upper lobe. Antenna three fourths as long as the body, sparsely ciliate beneath with rather short, erect hairs, densely punctate, with fine and coarse punctures intermixed on basal joint, the joints cylindrical, rather densely clothed with short, recumbent, dark brown pubescence above and paler pubescence beneath; first joint slightly shorter than the third and subequal in length to the fourth, the following joints gradually diminishing in length to the eleventh, which is slightly longer than the tenth and acutely spinose at apex.

Pronotum one third wider than long, subequal in width at base and apex; sides nearly parallel and armed on each side at middle with a large, acute tubercle, which is directed obliquely upward; disk transversely depressed or grooved along base and anterior margin, the median part uneven, slightly elevated, very coarsely, irregularly, transversely rugose, similar to the species of *Epicedia;* surface densely, finely punctate, with numerous coarse punctures intermixed, and with a few long, erect hairs intermixed with the recumbent pubescence. Scutellum subtriangular, about as long as wide, the surface densely pubescent.

Elytra four times as long as pronotum, and at base distinctly wider than pronotum; humeri rather feebly developed; humeral angles obtusely rounded; sides nearly parallel to behind the middle, then arcuately narrowed to the tips, which are separately broadly emarginate; disk even, moderately convex; surface minutely rugose, rather sparsely, very coarsely punctate and tuberculate basally, the punctures becoming finer and more distant toward the apices.

Abdomen beneath rather densely, obsoletely punctate or rugose, the punctures nearly concealed by the pubescence; last segment broadly, feebly, arcuately emarginate at apex. Tarsi densely clothed on upper side with dark brown and white hairs intermixed.

Length, 26–33 millimeters; width, 10–12 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from two examples (one type) collected at the type locality at an altitude of 3,000 feet, April 7–9, 1929.

35. **Monochamus baluanus** Aurivillius.

Mount Kinabalu: Kiau–Tenompok Pass, 3,000–4,700 feet, March 18, 1929, one specimen.

36. **Dihammus rusticator** Fabricius.

Mount Kinabalu: Kenokok, 3,300 feet, April 23, 1929, one specimen; Kabayau, near Mount Kinabalu, 600 feet, May 9–11, 1929, three specimens.

37. **Dihammus marmoratus** sp. n.

Male.—Elongate, robust, moderately convex above, strongly attenuate posteriorly, uniformly brownish-black above and beneath, and subopaque.

Head with the front quadrate, flat, the sides parallel, concave between the antennal tubercles, which are prominent, contiguous at bases, and obliquely divergent; surface with a narrow, longitudinal groove on occiput and vertex, sparsely, coarsely, irregularly punctate, densely, uniformly clothed with short, recumbent, brownish-yellow pubescence. Eyes coarsely granulated, deeply emarginate, the lower lobes about as wide as long. Antenna three times as long as the body, not ciliate beneath; first joint elongate, cylindrical, gradually expanded toward apex, one half as long as the third joint, and with a short, distinct cicatrix at apex.

Pronotum strongly transversely, equal in width at base and apex; sides constricted near base and apex, expanded at middle, armed on each side at middle with a long tubercle, which is wide at base, acute at apex, and directed obliquely upward; disk moderately convex, more or less uneven, feebly, broadly, transversely depressed at apical fourth, and with two narrow, transverse grooves near base; surface rather densely, coarsely, irregularly punctate on median part, sparsely punctate toward sides, densely, uniformly clothed with short, recumbent, brownish-yellow pubescence, which does not conceal the punctures. Scutellum subquadrate, broadly rounded at apex, densely clothed at sides with long, recumbent, golden yellow pubescence, longitudinally glabrous at middle.

Elytra four times as long as pronotum, distinctly wider than pronotum at base; humeri prominent, unarmed; sides obliquely narrowed from base to near the tips, which are separately narrowly rounded; disk moderately convex; surface rather densely, coarsely, irregularly punctate, the punctures becoming smaller toward apices, densely, uniformly clothed with short, recumbent, brownish-yellow pubescence, the surface more or less marmorated.

Body beneath densely, uniformly clothed with short, recumbent, olivaceous brown pubescence, which conceals the surface; last abdominal segment with a few visible coarse punctures, and feebly, broadly emarginate at apex.

Female.—Differs from the male in having the antennæ shorter, the sides of elytra parallel, and the last abdominal segment broadly subtruncate at apex.

Length, 16–23 millimeters; width, 2.5–7 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from six specimens, two males and four females (one male type). The type and three paratypes were collected at the type locality at an altitude of 5,500 feet, April 14–16, 1929; one paratype was collected at Marei Parei, Mount Kinabalu, at an altitude of 5,000 feet, April 29, 1929; and one paratype was collected at Kamborangah, Mount Kinabalu, at an altitude of 7,000 feet, March 26, 1929. This species is related to *rusticator* Fabricius, but it differs from that species in having the basal joint of antenna longer and more cylindrical, the pronotum longer, with the lateral tubercles more acute, the golden yellow pubescence on the scutellum longitudinally divided at the middle, and the pubescence on the elytra denser and more or less marmorated.

38. **Dihammus ater** sp. n.

Male.—Elongate, robust, moderately convex above, strongly attenuate posteriorly, feebly shining, uniformly black above and beneath; antenna with joints one and two black, joints three to six brownish-yellow, with the tips blackish, the following joints becoming dark brown.

Head with the front quadrate, flat, the sides parallel, concave between the antennal tubercles, which are prominent, contiguous at bases, and obliquely divergent; surface with a narrow, longitudinal groove extending from epistoma to occiput, sparsely, coarsely, irregularly punctate, densely, uniformly clothed with short, recumbent, greyish pubescence. Eyes coarsely granulated, deeply emarginate, the lower lobes about as wide as long. Antenna about four times as long as the body, not ciliate beneath; first joint elongate, cylindrical, gradually expanded toward apex, one half as long as the third joint, and with a short, distinct cicatrix at apex.

Pronotum strongly transverse, equal in width at base and apex; sides constricted near base and apex, expanded at middle, armed on each side at middle with a long tubercle, which is broad at base, acute at apex, and directed obliquely upward; disk rather even, moderately convex, with a narrow, transverse groove along base; surface rather densely, coarsely, irregularly punctate on median part, sparsely punctate toward sides, densely, uniformly clothed with short, recumbent, greyish pubescence, which does not conceal the punctures. Scutellum subquadrate, broadly rounded at apex, densely, uniformly clothed with long, recumbent, golden yellow pubescence.

Elytra four times as long as pronotum, distinctly wider than pronotum at base; humeri prominent, unarmed; sides obliquely narrowed from base to near the tips, which are separately narrowly rounded; disk moderately convex; surface densely, coarsely, irregularly punctate, the punctures becoming finer toward apices, densely, uniformly clothed with very short, recumbent, greyish pubescence, which gives the surface a slate coloured reflection.

Body beneath densely clothed with short, inconspicuous, grey pubescence, which does not conceal the surface; last abdominal segment broadly, arcuately emarginate at apex.

Length, 20 millimeters; width, 6 millimeters.

Type locality.—Mount Kinabalu: Kamborangah.

Described from four males (one type) collected at the type locality at an altitude of 7,000 feet, March 26 to April 1, 1929. This species is related to *rusticator* Fabricius, but it differs from that species in being uniformly black and densely clothed with greyish pubescence, giving the surface a slate colored appearance, and in having the basal joint of the antenna longer and more cylindrical, the intermediate joints of the antennæ bicolored, the pronotum distinctly narrower with the lateral tubercles more acute, and the scutellum densely, uniformly clothed with golden yellow pubescence.

39. **Orsidis oppositus** Pascoe.

Mount Kinabalu: Kiau, 3,000 feet, April, 1, 1929, one specimen.

40. Orsidis unicolor sp. n.

Elongate, moderately convex above, attenuate posteriorly, subopaque, uniformly brownish-black above and beneath, with the basal part of the antennal joints (except first and second) slightly paler.

Head with the front quadrate, slightly convex, the sides parallel, concave between the antennal tubercles, which are prominent and obliquely divergent; surface with a vague, narrow, longitudinal groove extending from epistoma to occiput, sparsely, coarsely, irregularly punctate, sparsely clothed with short, recumbent, inconspicuous, dark brown pubescence. Eyes coarsely granulated, deeply emarginate, the lower lobes about as long as wide. Antenna slightly longer than the body, not ciliate beneath; first joint elongate, cylindrical, feebly, gradually expanded toward apex, with a short, distinct cicatrix at apex, subequal in length to the fourth joint, which is one fourth shorter than the third.

Pronotum slightly wider than long, subequal in width at base and apex; sides parallel, feebly sinuate near base and apex, broadly expanded at middle, armed on each side at middle with a long tubercle, which is broad at base, acute at apex, and directed obliquely upward; disk moderately convex, broadly, transversely flattened along anterior margin, with two narrow, transverse grooves along base; surface densely, coarsely, deeply punctate on median part, impunctate beneath the lateral tubercles, densely, uniformly clothed with short, recumbent, inconspicuous, brown pubescence. Scutellum subtriangular, broadly rounded at apex, densely clothed with rather long, recumbent, whitish pubescence.

Elytra three and one half times as long as pronotum, distinctly wider than pronotum at base; humeri prominent, unarmed; sides obliquely narrowed from base to near the tips, which are separately broadly rounded; disk moderately convex; surface densely, coarsely, deeply punctate basally, the punctures forming more or less distinct longitudinal rows on basal halves, but becoming obsolete toward apices, densely, uniformly clothed with short, inconspicuous, recumbent, brown pubescence.

Body beneath densely, obsoletely punctate, densely clothed with short, recumbent, brownish pubescence; last abdominal segment broadly, transversely truncate at apex.

Length, 13 millimeters; width, 4 millimeters.

Type locality.—Mount Kinabalu: Kenokok.

Described from two specimens (one type) collected at the type locality at an altitude of 3,300 feet, April 23–24,

1929. This species is related to *dispar* Pascoe, but it differs from the description given for that species in having the head and pronotum densely, coarsely, and deeply punctate, and the upper surface densely clothed with brown pubescence.

41. **Macrochenus melanospilus Gahan.**

Mount Kinabalu: Kiau, 3,000 feet, April 5, 1929, one specimen.

42. **Aristobia pendleburyi sp. n.**

Elongate, moderately convex above, subopaque, uniformly black above and beneath, the elytra ornamented with four or five transverse, black pubescent fasciæ.

Head with the front quadrate, slightly convex, the sides parallel, slightly depressed behind the antennal tubercles, which are prominent, contiguous at bases, and obliquely divergent; surface with a distinct, longitudinal depression extending from epistoma to occiput, sparsely, coarsely, irregularly punctate, densely clothed with rather long, recumbent, black pubescence. Eyes finely granulated, deeply emarginate, the lower lobes about as long as wide. Antenna about as long as the body, and joints one, three, four, and five armed with tufts of long, black hairs; first joint rather short, cylindrical, gradually expanded toward apex, with a very distinct, closed cicatrix at apex, and subequal in length to the fourth joint, which is slightly shorter than the third.

Pronotum transverse, subequal in width at base and apex; sides nearly parallel, feebly constricted in front and behind middle, armed on each side at middle with a short, obtuse tubercle; disk moderately convex, with two narrow, transverse grooves near apical margin and two similar grooves near the base; surface coarsely, deeply, confluently punctate on median part, sparsely punctate toward the sides, rather densely clothed with short, recumbent, black pubescence, with a few long, erect, black hairs intermixed. Scutellum triangular, acute at apex, sparsely clothed with recumbent, black pubescence.

Elytra four times as long as pronotum, distinctly wider than pronotum at base; humeri not prominent, unarmed; sides parallel to apical fourth, then arcuately narrowed to the tips, which are separately arcuately emarginate; disk moderately convex; surface rather densely, coarsely, irregularly punctate, densely clothed with very short, recumbent, inconspicuous, bluish-white pubescence, and ornamented with four or five narrow, transverse, black pubescent fasciæ.

Abdomen beneath finely, densely punctate, densely clothed with short, recumbent, inconspicuous, brown pubescence; last segment truncate at apex.

Length, 20–23 millimeters; width, 7–8 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from two specimens (one type) collected at the type locality at an altitude of 3,000 feet, April 4–30, 1929. This species is related to *quadrifasciata* Aurivillius, but it differs from the description given for that species in having the head, pronotum, and antennæ uniformly black, the elytra clothed with bluish-white pubescence and ornamented with black pubescent fasciæ.

43. **Cereopsius sexmaculatus** Aurivillius.

Mount Kinabalu: Kiau, 3,000 feet, April 1–22, 1929, four specimens; Kiau–Tenompok Pass, 3,000–4,700 feet, March 18 and May 3, 1929, two specimens.

44. **Peribasis albisparsa** Ritsema.

Kabayau, near Mount Kinabalu, 600 feet, May 9, 1929, one specimen.

45. **Combe ornata** sp. n.

Robust, moderately convex above, strongly attenuate posteriorly, subopaque, above and beneath black, except the legs and antennæ, which are uniformly reddish-brown; elytra ornamented with numerous black pubescent spots.

Head with the front longer than wide, nearly flat, the sides strongly converging toward the top, angularly depressed between the antennal tubercles, which are prominent and obliquely divergent; surface with a narrow, longitudinal carina extending from epistoma to occiput, distinct on occiput but feebly indicated in front, finely, densely punctate, densely clothed with rather short, recumbent, brownish-white pubescence, with a few long, erect, black hairs around the eyes. Eyes finely granulated, deeply emarginate, the lower lobes rounded and about as wide as long. Antenna slightly longer than the body, feebly ciliate beneath; first joint elongate, cylindrical, scarcely expanded toward apex, with a distinct closed cicatrix at apex, subequal in length to the third joint, which is slightly longer than the fourth.

Pronotum nearly twice as wide as long, subequal in width at base and apex, widest just behind middle; sides narrowly constricted near apex, then obliquely expanded to a broad tubercle on each side just behind the middle, the tubercle acute at apex, and directed obliquely upward; disk very uneven, a narrow, transverse carina near apical margin, a rather broad, transverse depression on each side at apical fifth extending obliquely inward to a broad, irregular, median depression, which is interrupted by two strongly elevated, transverse carinæ, the posterior one angularly emarginate at middle, the basal third transversely flattened, with a narrow, transverse groove along the basal margin; surface finely, densely punctate, with a few coarse punctures intermixed, densely clothed with rather short, recumbent, brownish-white pubescence, except for a longitudinal median glabrous area. Scutellum subtriangular, broadly rounded at apex, densely clothed with recumbent, brownish pubescence.

Elytra four times as long as pronotum, distinctly wider than pronotum at base; humeri strongly developed, unarmed; base transversely truncate; sides obliquely narrowed from base to tips, which are each broadly, transversely truncate, and furnished with a short, broad tooth at outer angle; disk moderately convex; surface sparsely, coarsely, irregularly punctate basally, the punctures becoming obsolete toward apices, densely clothed with rather short, recumbent, brownish-white pubescence, ornamented with numerous small, round, black pubescent spots, which are more or less confluent in places, and each elytron ornamented with large, irregular, olivaceous white pubescent spots as follows: An elongate spot along lateral margin behind humerus, a round spot on disk at basal third, a transverse spot along lateral margin just behind middle, and a rounded spot along lateral margin near apex.

Body beneath densely, obsoletely punctate, rather densely, irregularly clothed with recumbent, brownish-white pubescence, which is denser along the posterior margins of the abdominal segments; last abdominal segment broadly subtruncate and feebly depressed at apex. Prosternal process deeply, abruptly, longitudinally depressed, with the sides strongly elevated between the anterior coxæ.

Length, 21 millimeters; width, 8 millimeters.

Type locality.—Mount Kinabalu: between Kiau and Tenompok.

Described from a single specimen collected at an altitude of 3,000 to 4,000 feet, April 19, 1929. This species is easily distinguished from *brianus* White in having the pronotum wider and without longitudinal pubescent vitta, the antennæ unicolored, the elytra ornamented with numerous black pubescent spots, and the sides of the prosternal process strongly elevated between the anterior coxæ.

46. **Eusyntheta brevicornis** Bates.

Mount Kinabalu: Kiau, 3,000 feet, April 11–29, 1929, two specimens; Lobang, 4,000 feet, April 5, 1929, one specimen.

47. **Batocera rubus** var. **sarawakensis** Thomson.

Mount Kinabalu: Kiau, 3,000 feet, March 30 and April 4, 1929, three specimens.

48. **Batocera hector** var. **borneensis** Schwarzer.

Mount Kinabalu: Kiau, 3,000 feet, March 16–17, 1929, five specimens.

49. **Apriona borneensis** Aurivillius.

Mount Kinabalu: Kiau, 3,000 feet, March 28 and April 3, 1929, two specimens; Lobang, 4,000 feet, April 5, 1929, one specimen.

50. **Imantocera plumosa** Olivier.

Mount Kinabalu: Kiau, 3,000 feet, March 17, 1929, three specimens.

51. **Chœromorpha polynesa** White.

Kabayau, near Mount Kinabalu, 600 feet, May 8, 1929, one specimen.

52. **Chœromorpha amica** White.

Mount Kinabalu: Kiau, 3,000 feet, March 17, 1929, one specimen.

53. **Palimna annulata** var. **tessellata** Pascoe.

Koung, near Mount Kinabalu, 1,300 feet, May 5, 1929, one specimen.

54. **Diastocera wallichi** var. **insularis** var. n.

Similar to *wallichi* Hope, but it differs from that species in having the elytra more coarsely punctured, the transverse, black pubescent fasciæ broader, of uniform width, and extending from the lateral margin to the sutural margin, except the anterior fascia on each elytron, which does not quite reach the sutural margin.

Length, 28–44 millimeters; width, 9–14 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from nineteen specimens (one type). The type and four paratypes were collected at the type locality at an altitude of 3,000 feet, during March, April, and May, 1929, by H. M. Pendlebury; nine paratypes were collected on Mount Kinabalu by Grenville Haslam; one paratype was collected on Mount Kinabalu at an altitude of 5,000–6,000 feet by A. D. Dodge and G. A. Goss; two paratypes are labelled " Borneo "; one paratype is labelled " Padang "; and one paratype was collected at Fort de Kock, Sumatra, during 1924 by E. Jacobson.

In the typical form of *wallichi* described by Hope from Nepal, Himalaya Mountains, the transverse, black pubescent fasciæ on the elytra are narrow, more or less constricted, not extending to the sutural or lateral margins, and the anterior fascia on each elytron is divided into a number of spots.

55. **Nyctimene varicornis** Fabricius.

Mount Kinabalu: Kiau–Tenompok Pass, 3,000–4,700 feet, March 18, 1929, one specimen.

56. **Mœchotypa infasciculata** Pic.

Mount Kinabalu: Kiau, 3,000 feet, April 5, 1929, one specimen.

57. **Abryna rubeta** Pascoe.

Mount Kinabalu: Kenokok, 3,300 feet, April 24, 1929, two specimens.

58. **Pterolophia monticola** sp. n.

Elongate, robust, strongly convex above, subopaque, uniformly dark brown, without distinct pubescent designs.

Head with the front as wide as long, flat, feebly, broadly concave between the antennal tubercles, more deeply depressed between the upper lobes of the eyes, with a narrow, longitudinal groove extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, intervals finely granulose, densely clothed with short, recumbent, brown, pale yellow, and white hairs intermixed. Eyes divided, separated from each other on the top by four times the width of the upper lobe. Antenna shorter than the body, robust, rather densely ciliate beneath with long, black hairs, densely clothed with short, recumbent, brown and yellowish hairs, with numerous short, white hairs intermixed on basal joints, the apical half on inner side of fourth joint, and the following joints more or less annulated at bases with whitish pubescence; first joint subcylindrical, subequal in length to the third and fourth joints, the following joints distinctly shorter and diminishing in length.

Pronotum slightly wider than long, uniformly convex above; sides nearly parallel; surface coarsely, densely, irregularly punctate, more or less rugose, densely clothed with short pubescence similar to that on the head. Scutellum subquadrate, broadly rounded at apex.

Elytra three and one half times as long as pronotum, and at base distinctly wider than pronotum; sides strongly declivous, parallel to apical fourth, then arcuately narrowed to the tips, which are separately broadly rounded and strongly declivous; disk strongly convex, without basal crests, but each elytron with three or four vague, obtusely rounded, longitudinal costæ behind the middle; surface densely, coarsely, irregularly punctate, densely clothed with short, recumbent, brownish and whitish pubescence, the whitish pubescence forming two or three very inconspicuous, irregular, transverse fasciæ posteriorly.

Abdomen beneath, except last segment, densely clothed with moderately long, recumbent, yellowish-white hairs, with a few long, erect hairs intermixed; last segment densely clothed with short, dark brown and white hairs intermixed, and broadly depressed near apex; legs densely clothed with short pubescence similar to that on the head.

Length, 12 millimeters; width, 4.5 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from a single male collected at an altitude of 3,000 feet, April 7, 1929. This species is allied to *sibuyana* Aurivillius, but it differs from that species in being more parallel posteriorly, and in having the pubescence shorter and darker, and the last abdominal segment clothed with dark brown and white hairs intermixed.

59. **Pterolophia borneensis** sp. n.

Robust, moderately elongate, more or less flattened above, dark reddish-brown, the legs and antennæ slightly paler, and the elytra ornamented with inconspicuous pubescent designs.

Head with the front strongly transverse, feebly convex, broadly concave between the antennal tubercles, which are short and separated at bases, rather deeply depressed and finely, longitudinally carinate on the occiput; surface finely, densely punctate on the front, coarsely, irregularly punctate on the occiput, densely clothed with long, recumbent, brownish-white pubescence, with a few long, erect hairs at the sides and along anterior margin. Eyes coarsely granulated, divided, the upper lobe very small, lower lobe small and round. Antenna about as long as the body, sparsely clothed with recumbent, brownish and yellowish-white pubescence, and sparsely ciliate beneath; first joint robust, subcylindrical, flattened beneath, subequal in length to the third joint, which is slightly shorter than the fourth.

Pronotum strongly transverse, equal in width at base and apex, widest in front of middle; sides feebly rounded, unarmed; disk moderately convex, feebly, broadly, transversely flattened along anterior margin and behind middle; surface densely, coarsely, deeply punctate, rather densely clothed with long, recumbent, brownish-yellow pubescence. Scutellum subtriangular, broadly rounded at apex, densely clothed with long, recumbent, brownish-white pubescence.

Elytra nearly four times as long as pronotum, considerably wider than pronotum at base, strongly declivous posteriorly; sides parallel from base to apical fourth, then arcuately narrowed to the tips, which are separately broadly rounded; disk uneven, strongly flattened basally, gibbose behind the middle, and each elytron with two or three longitudinal costæ, the inner one composed of two longitudinal crests, one near base, the other behind middle; surface coarsely, deeply, irregularly punctate, the punctures becoming finer toward apices, sparsely clothed with recumbent, brownish-yellow pubescence, the middle third more sparsely pubescent, irregularly ornamented with a few inconspicuous, brown pubescent spots.

Body beneath finely, densely punctate, densely clothed with long, recumbent, brownish-white pubescence, with a few erect hairs intermixed; last abdominal segment subequal in length to the preceding two segments united, and broadly subtruncate at apex; legs clothed with long, flying, white hairs.

Length, 8 millimeters; width, 3.25 millimeters.

Type locality.—Mount Kinabalu: Kamborangah.

Described from a single specimen collected at an altitude of 7,000 feet, March 26, 1929. This species is allied to *aberrans* Aurivillius, but it differs from that species in being much smaller, and in having the pronotum coarsely punctured and the disk unarmed, the tips of the elytra rounded, and the longitudinal crests on the elytra not furnished with tufts of long hairs.

60. Genus **Ancornallis** gen. n.

Head small, narrower than pronotum, the front quadrate; mandibles rather short, robust; antennal tubercles moderately elevated, divergent; cheeks moderately long. Antenna broken, slender, rather densely ciliate beneath, unarmed; first joint robust, oval, not cicatricose at apex, one half as long as fourth joint, which is slightly longer than the third; third and fourth joints slightly arcuate, the following joints gradually diminishing in length. Eyes small, rather finely granulated, deeply emarginate. Pronotum wider than long, unarmed at the sides. Elytra wider than pronotum, elongate, convex, attenuate posteriorly, without sutural depressions, but each elytron armed with a longitudinal crest at base; humeri rather prominent. Legs short, subequal in length; femora strongly expanded at middle, the posterior pair shorter than abdomen; intermediate tibiæ grooved; tarsi short, the third joint broadly expanded; tarsal claws divergent; anterior coxæ globose, slightly angulated externally, the cavities closed posteriorly; middle coxal cavities open externally. Prosternal process moderately wide, arcuately declivous in front and behind, expanded posteriorly. Body oblong, navicular.

Genotype.—*Ancornallis cristatus* sp. n.

This genus belongs to the tribe Ptericoptini and is related to *Cornallis* Thomson, but it differs from that genus in having the antennæ densely ciliate beneath, the posterior femora shorter than the abdomen, the pronotum wider than long, and the tarsi shorter.

Ancornallis cristatus sp. n.

Oblong, navicular, slightly flattened above, subopaque, uniformly dark reddish-brown above and beneath, and variegated with dark brown and brownish-white pubescence.

Head with the front nearly flat, slightly narrower above than beneath, feebly, broadly concave between the antennal tubercles, with a narrow, longitudinal groove on vertex and occiput; surface rather densely, coarsely, deeply punctate, rather densely clothed with moderately long, recumbent, brownish-yellow pubescence; eyes separated from each other on the top by one and one half times the width of the upper lobe. Antenna rather densely clothed with short, recumbent, brownish-white pubescence.

Pronotum slightly wider than long, subequal in width at base and apex; sides nearly parallel; disk moderately, uniformly convex; surface sparsely, deeply, coarsely, irregularly punctate, densely clothed with short, recumbent, brown and brownish-white pubescence, and ornamented on each side of the middle with a rather broad, inconspicuous, longitudinal vitta of dark brown hairs extending from base to anterior margin. Scutellum subtriangular, broadly rounded at apex, sparsely clothed with short, recumbent hairs.

Elytra four and one half times as long as pronotum, and at base distinctly wider than pronotum; humeral angles broadly rounded; sides obliquely narrowed from base to near the tips, which are divergent, and strongly, acutely produced; disk slightly uneven, more or less flattened on basal half, strongly convex posteriorly, strongly, abruptly declivous at the sides anteriorly, and each elytron with a short, longitudinal, basal crest; surface more or less longitudinally striate toward sides, rather densely, coarsely, deeply punctate, the punctures irregularly distributed behind scutellum, but arranged in more or less distinct rows toward the sides, rather densely clothed with short, recumbent, brownish pubescence, and variegated with small, irregular spots of paler brown hairs, with a rather distinct, small spot of brownish-white hairs on each elytron near middle.

Body beneath rather densely clothed with moderately long, recumbent, whitish pubescence; metasternum and mesosternum sparsely, coarsely, deeply punctate; abdomen densely, finely, inconspicuously punctate, the last segment broadly rounded at apex.

Length, 9 millimeters; width, 2.65 millimeters.

Type locality.—Mount Kinabalu: Kamborangah.

Described from a single specimen collected at an altitude of 7,000 feet, April 2, 1929.

61. **Acroama armata** Jordan.

Mount Kinabalu: Kiau, 3,000 feet, April 7, 1929, one specimen.

62. **Ectatosia maculosa** sp. n.

Elongate, strongly attenuate posteriorly, strongly flattened above, subopaque, uniformly reddish-brown above and beneath, and densely ornamented with small, round, yellowish-white pubescent spots.

Head with the front subquadrate, slightly convex, slightly narrowed toward top, deeply, angularly depressed between the antennal tubercles, which are moderately elevated, with a narrow, longitudinal groove extending from epistoma to occiput; surface finely, densely punctate, with numerous coarse punctures intermixed, densely clothed with inconspicuous, brown pubescence, and irregularly ornamented with small, yellowish-white pubescent spots. Eyes divided; upper lobe small, narrow; lower lobe transversely oblong. Antenna robust, one half as long as body, rather densely clothed with moderately long, brownish and whitish hairs intermixed on the first four joints, uniformly brown pubescence on the fifth joint, and denser, recumbent, brownish and whitish pubescence on the following joints, the five basal joints densely ciliate beneath with long, black hairs; first joint twice as long as wide, cylindrical; joints three and four subequal in length, and together equal in length to the following joints united.

Pronotum slightly longer than wide, slightly narrower at apex than at base; sides nearly parallel, unarmed; disk moderately convex, slightly uneven; surface coarsely, deeply, irregularly punctate, rather densely clothed with short, recumbent, brown pubescence, and densely, irregularly ornamented with small, yellowish-white pubescent spots. Scutellum broadly triangular, broadly rounded at apex, sparsely clothed with brown pubescence.

Elytra five times as long as pronotum, and distinctly wider than pronotum at base; sides obliquely narrowed from base to the tips, which are conjointly broadly, arcuately emarginate, and each furnished with a short tooth at sutural angle; disk moderately convex, broadly, longitudinally depressed along sutural margins, which are slightly elevated posteriorly; surface coarsely, deeply, irregularly punctate, the punctures denser basally, but becoming finer and sparser toward apices, clothed with pubescence similar to that on the pronotum.

Body beneath finely, densely punctate, or feebly rugose, rather densely clothed with short, recumbent, brown hairs and yellowish-white pubescent spots, with a few erect hairs intermixed; last abdominal segment broadly, transversely subtruncate at apex.

Length, 20–23 millimeters; width, 4.5–5 millimeters.

Type locality.—Mount Kinabalu: Kenokok.

Described from three specimens (one type) collected at the type locality at an altitude of 3,300 feet, April 20–26, 1929. This species is allied to *moori* Pascoe, but it differs from that species in being densely, irregularly ornamented above and beneath with small, yellowish-white pubescent spots.

63. Genus **Neoepaphra** gen. n.

Head not retractile, the front obliquely inclined, trapeziform; antennal tubercles prominent, feebly separated, slightly divergent; cheeks moderately long; maxillary palpi longer than labial palpi, the last joints cylindrical, acute at apices. Antenna 11-jointed, shorter than body, rather robust, densely ciliate beneath, unarmed; first joint robust, short, cylindrical, not cicatricose at apex, two thirds as long as third joint, which is longer than the fourth, the following joints each one half as long as the first joint and subequal in length. Eyes finely granulated, deeply emarginate, lower lobes triangular, upper lobes narrow and strongly transverse. Pronotum wider than long, subcylindrical, unarmed. Elytra wider than pronotum, moderately convex, slightly attenuate posteriorly, rounded at apices; epipleura not dilated at base; humeri not prominent. Legs moderately long; posterior femora slightly longer than abdomen; intermediate tibiæ grooved; tarsi short, joints one, two, and three subequal in length, the third broadly dilated; tarsal claws simple, divergent. Anterior coxæ globose, slightly angulated externally, the coxal cavities closed posteriorly. Middle coxal cavities open externally. Prosternal process moderately wide, arcuately declivous in front and behind, expanded posteriorly. Mesosternal process obliquely declivous, longitudinally depressed, not tuberculate. Body broadly elongate, densely pubescent.

Genotype.—*Neoepaphra pulchella* sp. n.

This genus belongs to the tribe Ischiolonchini and is related to *Epaphra* Newman, but it differs from that genus

Genotype.—*Heteropalpoides aberrans* sp. n.

The position of this genus is somewhat uncertain. It agrees with the characters given for the tribe Emphytoeciini by Lacordaire (Genera des Coléoptères, tome IX, 1872, p. 713) in having the intermediate coxal cavities closed, the tarsal claws divergent, the intermediate tibiæ without grooves, and the basal joints of the antennæ without a cicatrix at apices—a combination of characters rarely found in the Lamiinæ. It differs, however, from the characters given for this tribe in having the terminal joints of the maxillary palpi and labial palpi dissimilar, the eyes coarsely granulated, and the pronotum armed with short tubercles.

Heteropalpoides aberrans sp. n.

Rather narrowly elongate, moderately convex, subopaque, dark reddish-brown, the tibiæ, and basal halves of the femora and antennal joints paler, the elytra irregularly variegated with dark brown, yellowish-brown, and whitish pubescence.

Head with the front strongly transverse, broadly concave between the antennal tubercles, with a narrow, longitudinal groove extending from occiput to epistoma; surface sparsely, coarsely, irregularly punctate, densely clothed with moderately long, recumbent, brownish pubescence, with a few long, erect hairs intermixed; eyes separated from each other on the top by twice the width of the upper lobe. Antenna densely clothed with short, recumbent, brownish pubescence, with numerous long, erect hairs intermixed, and each joint broadly annulated at base with white pubescence.

Pronotum quadrate, subequal in width at base and apex, widest at middle; sides nearly parallel, feebly, broadly expanded at middle, armed on each side at middle with a small, obtuse tubercle; disk moderately convex, armed on each side of middle with a round, obtuse tubercle; surface coarsely, sparsely, irregularly punctate, densely clothed with moderately long, recumbent, brownish pubescence, with a few long, erect hairs intermixed, and variegated with a few obsolete, white pubescent spots. Scutellum transverse, broadly rounded at apex, sparsely clothed with short, recumbent pubescence.

Elytra three times as long as pronotum, and at base distinctly wider than pronotum, widest behind middle; sides feebly, obliquely expanded from base to behind middle, then arcuately narrowed to the tips, which are separately broadly rounded; disk broadly, transversely flattened on basal third, strongly convex posteriorly, abruptly deflexed basally toward sides, the sutural margins rather strongly elevated, and each elytron with a short, longitudinal, basal crest; surface sparsely, coarsely, irregularly punctate, densely clothed with moderately long, recumbent, dark brown and yellowish-brown pubescence with numerous long, erect, stiff, whitish hairs intermixed, and irregularly variegated with inconspicuous, whitish pubescent spots.

Body beneath finely, densely punctate, rather densely clothed with moderately long, recumbent, whitish pubescence, with numerous long, erect, flying, whitish hairs, especially on the legs; last abdominal segment broadly rounded at apex.

Length, 6 millimeters; width, 2 millimeters.

Type locality.—Mount Kinabalu: Pakka.

Described from a single specimen collected at an altitude of 10,000 feet, March 23, 1929.

65. **Emeopedus alboguttatus** sp. n.

Small, moderately robust, flattened above, feebly shining, reddish-brown above and beneath, the antennæ, bases of tibiæ and femora paler.

Head with the front strongly transverse, feebly convex, broadly concave between the antennal tubercles, which are feebly elevated and widely separated, with a vague, longitudinal carina extending from epistoma to occiput; surface coarsely, sparsely, irregularly punctate, sparsely clothed with moderately long, recumbent, yellowish-white pubescence. Eyes small, coarsely granulated, deeply emarginate. Antenna slender, slightly longer than body, sparsely ciliate beneath with long, black hairs; first joint rather long, cylindrical, two thirds as long as the third joint, which is subequal in length to the fourth, the following joints gradually diminishing in length.

Pronotum quadrate, equal in width at base and apex; sides unarmed, nearly parallel, feebly sinuate, slightly constricted at base; disk moderately convex, feebly, transversely depressed along base; surface coarsely, rather densely, irregularly punctate, sparsely clothed with recumbent pubescence, which is brownish on the median part and yellowish-white toward the sides. Scutellum slightly transverse, broadly rounded at apex, densely clothed with long, recumbent, whitish pubescence.

Elytra three times as long as pronotum, considerably wider than pronotum at base, widest behind middle; sides feebly, obliquely expanded from base to behind middle, where they are broadly rounded, then obliquely narrowed to the tips, which are separately narrowly rounded; disk broadly, transversely flattened on basal half, strongly convex behind middle; surface rather densely, coarsely, irregularly punctate, sparsely clothed with short, inconspicuous, brown pubescence, with numerous small, irregularly distributed, whitish pubescent spots, and each elytron ornamented with a large, irregular, whitish pubescent spot at basal third, and a similar spot behind the middle.

Body beneath finely, densely punctate, rather densely clothed with long, recumbent, whitish pubescence; last abdominal segment broadly, transversely truncate at apex.

Length, 2.75–3.5 millimeters; width at middle of elytra, 1.25–1.37 millimeters.

Type locality.—Mount Kinabalu: Kamborangah.

Described from two specimens (one type) collected at the type locality at an altitude of 7,000 feet, March 27–28, 1929. The paratype is slightly smaller than the type, and differs from it in having the tarsi yellowish, and in not having the two large whitish pubescent spots on each elytron distinctly marked. This species differs from the other described species of this genus in having the elytra broadly depressed on the basal halves, and the sides arcuately expanded behind the middle.

66. **Xyaste uniformis** Heller.

Kabayau, near Mount Kinabalu, 600 feet, May 10, 1929, one specimen.

67. **Glenea elegans** Olivier.

Mount Kinabalu: Kiau, 3,000 feet, March 16 to April 23, 1929, six specimens; Kenokok, 3,300 feet, April 25–26, 1929, two specimens.

68. **Glenea extensa** Pascoe.

Mount Kinabalu: Kiau, 3,000 feet, April 5, 1929, one specimen.

69. **Glenea acuta** var. **montana** Jordan.

Kabayau, near Mount Kinabalu, 600 feet, May 12, 1929, one specimen.

70. **Glenea aurivillii** sp. n.

Above uniformly dark reddish-brown, and ornamented with yellowish pubescence; beneath reddish-brown, with the legs yellowish testaceous; antenna with the two or three basal joints reddish-brown, the following joints dark brown.

Head with the front as long as wide, nearly flat between the antennal tubercles, with a narrow, smooth, longitudinal carina extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, densely clothed with recumbent hairs, which are dark brown on the vertex and occiput, and yellowish on the front, the yellow hairs forming a narrow, longitudinal vitta on the occiput; antennæ about as long as the body.

Pronotum slightly wider than long, uniformly convex; sides nearly parallel; surface densely clothed with recumbent, black hairs anteriorly, basal third densely clothed with recumbent, pale yellow and brown hairs intermixed, and the disk ornamented with a narrow, obsolete, longitudinal, median, yellow pubescent vitta; punctures nearly concealed by the pubescence. Scutellum broad, concave, densely clothed with pale yellow pubescence.

Elytra strongly carinate and strongly deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at the sutural margin and a longer spine at the outer angle; surface coarsely, sparsely, irregularly punctate basally, impunctate toward the apices, rather densely clothed with short, recumbent, dark brown hairs, and each elytron ornamented with pale yellow pubescence as follows: Two large spots arranged transversely just behind the middle, the inner spot larger, rectangular, the outer one oblong, and a large, oblong spot at apex; deflexed sides slightly more reddish-brown than above, and each with two longitudinal rows of coarse punctures on basal two thirds.

Body beneath rather sparsely, irregularly clothed with short, recumbent, whitish pubescence.

Length, 13 millimeters; width, 4 millimeters.

Type locality.—Mount Kinabalu: Kenokok.

Described from a single female collected at an altitude of 3,300 feet, April 23, 1929. This species resembles *funerula* Thomson, but it can be distinguished from that species by the different arrangement of the yellow pubescent spots on the upper surface, these spots being silvery white in *funerula*.

71. **Glenea borneensis** sp. n.

Above uniformly dark brown, ornamented with pale yellow pubescence; beneath dark brown, with the legs yellowish testaceous; antennæ uniformly dark reddish-brown.

Head with the front longer than wide, nearly flat between the antennal tubercles, without a distinct longitudinal, median carina; surface rather densely, coarsely, irregularly punctate; sparsely clothed with short, inconspicuous, brown hairs on median part, densely clothed at sides with long, recumbent, whitish-yellow hairs, which form two narrow vittæ on the occiput; antennæ about as long as the body.

Pronotum distinctly wider than long, uniformly convex; sides feebly, arcuately rounded anteriorly, parallel near base; surface densely, coarsely punctate, sparsely clothed with inconspicuous, recumbent and erect, brown hairs intermixed, and ornamented with recumbent, tawny yellow hairs as follows: A broad, longitudinal, median vitta extending from base to anterior margin, the vitta constricted behind middle and expanded in front of scutellum, and a narrow fascia on each side along base at posterior angle. Scutellum broad, feebly concave, densely clothed with recumbent, tawny yellow hairs.

Elytra strongly carinate and strongly deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at the sutural margin and a longer spine at the outer angle; surface coarsely, densely punctate basally, the punctures becoming obsolete toward apices, sparsely clothed with inconspicuous, recumbent and erect, brown hairs intermixed, and each elytron ornamented with five large, tawny yellow pubescent spots as follows: One at the middle of elytron at basal fourth, one along lateral carina at basal third, one along sutural margin at middle, one along lateral carina at apical third, and one near apex; deflexed sides each with two longitudinal rows of coarse punctures on basal two thirds.

Body beneath densely clothed with brown and white pubescence, the white pubescence predominating on the sternum and middle of abdomen, and forming spots on the sides of the abdominal segments.

Length, 12 millimeters; width, 3.5 millimeters.

Type locality.—Mount Kinabalu: Kenokok.

Described from a single female collected at an altitude of 3,300 feet, April 24, 1929. This species is allied to *pustulata* Thomson, but it differs from that species in being dark brown or black above, and in having the pronotum wider than long, without a longitudinal pubescent vitta on each side, and by the different arrangement of the yellow pubescent spots on the elytra.

72. **Glenea kinabaluensis** sp. n.

Head, pronotum, body beneath, femora, and basal halves of tibiæ reddish-brown; apical halves of tibiæ, and the tarsi, dark brown; elytra dark brown and ornamented with narrow, longitudinal, white pubescent vittæ; antenna dark brown, with the eighth, ninth, tenth, part of the eleventh, and apices of the third to seventh joints densely clothed with silvery white pubescence.

Head with the front as long as wide, feebly flattened between the antennal tubercles, with a narrow, longitudinal carina extending from epistoma to occiput; surface densely, coarsely, irregularly punctate, rather densely clothed with moderately long, recumbent, white pubescence, which forms two narrow, longitudinal vittæ on the occiput; antennæ slightly longer than the body.

Pronotum slightly wider than long, uniformly convex; sides nearly parallel, feebly constricted behind middle; surface densely, coarsely, irregularly punctate, sparsely clothed with short, recumbent, inconspicuous hairs, with a few long, erect hairs intermixed, and ornamented with five narrow, longitudinal, white pubescent vittæ, one median and two on each side. Scutellum broad, nearly flat, sparsely clothed with white pubescence.

Elytra feebly carinate and moderately deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at sutural margin and a longer spine at the outer angle; surface coarsely, rather densely punctate basally, the punctures more or less arranged in irregular rows and becoming obsolete toward apices, rather densely clothed with short, recumbent, brownish pubescence, and each elytron ornamented with five narrow, longitudinal, silvery white pubescent vittæ, one along sutural margin, two on disk, one on the deflexed side, and one along lateral margin, the two median vittæ and one on deflexed area more or less connected near apex of elytron.

Body beneath rather densely, uniformly clothed with short, recumbent, silvery white pubescence.

Length, 12 millimeters; width, 3 millimeters.

Type locality.—Mount Kinabalu: Marei Parei.

Described from a single female collected at an altitude of 5,000 feet, April 28, 1929. This species is allied to *strigata* Thomson, but it differs from that species in having the front of the head as wide as long and uniformly clothed with white pubescence, the outer joints of the antennæ white, each elytron ornamented with five white pubescent vittæ, and the pubescence shorter and more uniformly distributed on the underside of the body.

73. **Glenea lumulumuensis** sp. n.

Above and beneath uniformly dark reddish-brown, except the legs, which are yellowish testaceous, with the tarsi slightly paler; above ornamented with whitish pubescent spots and vittæ; antenna dark reddish-brown, with the ninth and tenth joints uniformly pale yellow.

Head with the front as wide as long, nearly flat between the antennal tubercles, with a narrow, longitudinal carina extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, rather densely clothed with recumbent, brown and whitish hairs intermixed, the whitish hairs denser along the sides, and ornamented with two rather broad, longitudinal, whitish pubescent vittæ on the occiput; antennæ about as long as the body.

Pronotum as wide as long, uniformly convex; sides nearly parallel, vaguely constricted behind middle; surface rather densely, coarsely, irregularly punctate, densely clothed with recumbent, black pubescence, with a few long, erect hairs intermixed, and ornamented with three broad, longitudinal, whitish pubescent vittæ, one median and one on each side. Scutellum broad, slightly concave, densely clothed with whitish pubescence.

Elytra strongly carinate and strongly deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at the sutural margin and a longer spine at the outer angle; surface coarsely, rather densely, irregularly punctate basally, the punctures becoming obsolete toward apices, rather densely clothed with short, recumbent, brown pubescence, and each elytron ornamented with whitish pubescence as follows: A narrow vitta along sutural margin extending from middle to apex, a narrow vitta along lateral carina extending from base to a more or less distinct apical spot, and two large, median spots, one at basal fourth, the other just in front of middle; deflexed sides each with two longitudinal rows of coarse punctures on basal two thirds.

Body beneath rather densely clothed with short, recumbent, whitish pubescence, except for a dark area covering the outer margin of metasternum and inner part of metasternal episternum.

Length, 10–13 millimeters; width, 2.5–3.5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from two females (one type) collected at the type locality at an altitude of 5,500 feet, April 10–16, 1929. This species resembles *univittata* Aurivillius, but it differs from that species in having two longitudinal, whitish pubescent vittæ on the top of the head, the pubescent vittæ on the elytra narrower, the ninth and tenth joints of the antenna uniformly pale yellow, the legs yellowish testaceous, and in having two whitish pubescent spots on each elytron.

74. **Glenea schwarzeri** sp. n.

Above and beneath dark reddish-brown, with the legs slightly paler, the upper surface ornamented with brownish-yellow pubescence; antenna uniformly reddish-brown.

Head with the front distinctly longer than wide, broadly concave between the antennal tubercles, with a narrow, longitudinal carina extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, densely clothed with short, recumbent, brownish pubescence, and ornamented along the sides, around the eyes, and two narrow, longitudinal vittæ on the occiput, with moderately long, recumbent, brownish-yellow pubescence; antennæ about as long as the body.

Pronotum as wide as long, uniformly convex; sides nearly parallel, strongly constricted behind the middle; surface coarsely, rather densely punctate on disk, feebly punctate at sides, densely clothed with short, recumbent, brownish pubescence, and ornamented with seven narrow, brownish-yellow pubescent vittæ, one median and three on each side, the two outer vittæ on each side abbreviated and strongly sinuate. Scutellum broad, concave, densely clothed with short, dark brown pubescence.

Elytra strongly carinate and deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at the sutural margin and a longer spine at the outer angle; surface coarsely, rather densely punctate basally, the punctures becoming finer and sparser toward apices, rather densely clothed with short, recumbent, brown and dark grey pubescence intermixed, each elytron ornamented with seven or eight more or less conspicuous, irregularly-shaped, elongate, brownish-yellow pubescent spots, and a few elongate, velvety black pubescent spots, the largest black spot in front of middle; deflexed sides each with two longitudinal rows of coarse punctures extending nearly to the apices.

Body beneath rather densely clothed with short, recumbent, brown and grey pubescence, except the metasternum, posterior half of metasternal episternum, and sides of fourth abdominal segment, which are densely clothed with moderately long, whitish pubescence.

Length, 14 millimeters; width, 4.5 millimeters.

Type locality.—Mount Kinabalu: Kiau-Tenompok Pass.

Described from a single female collected at an altitude of 3,000 to 4,700 feet, March 18, 1929. This species is very closely allied to *melia* Pascoe according to the description given for that species. The writer has been unable to examine any specimens of *melia*, but *schwarzeri* seems to differ from it in having seven yellow pubescent vittæ on the pronotum, the elytra ornamented with velvety black pubescent spots, the metasternum uniformly covered with white pubescence, and the fourth abdominal segment ornamented on each side with white pubescence.

75. Glenea pendleburyi sp. n.

Head with the front longer than wide, feebly, broadly depressed between the antennal tubercles, with a narrow, longitudinal, smooth carina extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, rather densely clothed with recumbent, brownish-yellow pubescence, and ornamented on occiput with a yellow pubescent spot, which extends along upper margin of eyes, and divided at middle by the longitudinal carina; antennæ about as long as the body, uniformly dark brown.

Pronotum as wide as long, uniformly convex; sides nearly parallel, feebly constricted behind middle; surface densely clothed with velvety black pubescence, concealing the surface, the pubescence slightly brownish toward the sides. Scutellum broad, concave, densely clothed with black pubescence, except at the apex, where the pubescence is yellowish.

Elytra strongly carinate, deflexed at the sides; apex of each elytron arcuately emarginate, furnished with a short spine at the sutural margin and a longer spine at the outer angle; surface with a narrow, transversely oblique, irregular, tawny yellow pubescent fascia at middle, and a large, transverse spot of the same colour on each elytron near apex; disk in front of median fascia testaceous, sparsely, coarsely, irregularly punctate, densely clothed with short, recumbent, pale brown pubescence; disk behind median fascia black, densely clothed with velvety black pubescence (slightly brownish toward apices), without distinct punctures; deflexed sides densely clothed on basal halves with moderately long, recumbent, white hairs, on apical halves with shorter, brownish hairs, and each with two longitudinal rows of coarse punctures extending nearly to the apices.

Abdomen beneath densely clothed at the sides with moderately long, silvery white pubescence; legs yellowish testaceous, with all the tarsi of the anterior and middle pairs and the last three joints of the posterior pair sparsely clothed with white pubescence over a dark brown surface on upper side.

Length, 13 millimeters; width, 4 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single female collected at an altitude of 5,500 feet, April 19, 1929. This species resembles *anticepunctata* Thomson, but it differs from that species in having the yellow pubescent spot on the head extending around the upper margin of the eyes and the spot divided at the middle by the longitudinal carina, the transverse median fascia on each elytron more oblique, irregular, and more or less constricted at the middle, and the preapical tawny yellow pubescent spot on each elytron more transverse.

76. **Nupserha elongata** ab. **pallescens** Aurivillius.

Kabayau, near Mount Kinabalu, 600 feet, May 11, 1929, two specimens; Koung-Kabayau Pass, near Mount Kinabalu, 800 feet, May 6, 1929, one specimen.

77. **Nupserha ustulata** var. **nigricornis** var. n.

Similar to *ustulata* Erichson, but it differs from that species in having the head uniformly black, the antennæ more or less yellow-brown, the pronotum more coarsely punctured, and the tips of the elytra more transversely truncate and not so acutely toothed at the outer angles.

Length, 12–14 millimeters; width, 2.5–3 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from three specimens (one type). The type and one paratype were collected at the type locality at an altitude of 3,000 feet, April 7–16, 1929, and the other paratype was collected at Kabayau, near Mount Kinabalu, at an altitude of 600 feet, May 10, 1929.

78. **Oberea bivittata** Aurivillius.

Mount Kinabalu, Kiau, 3,000 feet, April 17, 1929, one specimen.

79. **Oberea rubetra** Pascoe.

Mount Kinabalu, Kiau, 3,000 feet, April 17, 1929, one specimen.

80. **Oberea monticola** sp. n.

Head and antennæ uniformly black; pronotum yellowish testaceous; scutellum and elytra dark yellowish-brown, the latter with the sides and apices black; body beneath black, with the prosternum, mesosternum, coxæ, and median parts of first four abdominal segments yellowish testaceous; legs black, with the tarsi slightly more reddish.

Head with the front wider than long, strongly convex, slightly concave between the antennal tubercles, with a narrow, longitudinal groove on the front and vertex; surface densely, coarsely, confluently punctate, intervals finely punctate, sparsely clothed with long, erect, inconspicuous, black hairs; antennæ about as long as the body.

Pronotum as wide as long, cylindrical, slightly uneven; sides nearly parallel, slightly sinuate; surface coarsely, irregularly, densely punctate, the punctures very shallow and inconspicuous, rather densely clothed with short, semierect, inconspicuous, yellow pubescence, with a few long, erect hairs of the same colour intermixed. Scutellum subquadrate, truncate at apex.

Elytra slightly wider than pronotum at base, arcuately deflexed at the sides, flattened above; sides very broadly, feebly constricted along the middle, feebly, arcuately expanded near the tips, which are separately strongly, obliquely truncate, with the outer angle rather acute; surface densely, coarsely punctate, the punctures more or less arranged in longitudinal rows basally, but becoming more irregularly distributed toward apices, densely clothed with short, recumbent pubescence, whitish on disk, brown at the sides, and with a long, erect hair in each puncture.

Body beneath densely, finely punctate, with a few coarser punctures intermixed, rather densely clothed with short, recumbent, whitish or yellowish pubescence, with a few longer, erect hairs intermixed; apex of posterior femora extending slightly beyond the first abdominal segment.

Length, 15 millimeters; width, 2.5 millimeters.

Type locality.—Mount Kinabalu: Lumu Lumu.

Described from a single specimen collected at an altitude of 5,500 feet, April 19, 1929. This species is allied to *erythrostoma* Heller, but it differs from that species in being narrower with the sides of the elytra more parallel, and in having the head and elytra more densely punctured, and the pronotum and median parts of the first four abdominal segments yellowish testaceous.

81. **Ochrocesis evanida** Pascoe.

Kabayau, near Mount Kinabalu, 600 feet, May 9–12, 1929, three specimens.

82. **Chreonoma seminuda** sp. n.

Female.—Elongate, subcylindrical, strongly shining, similar in form to *discoidalis* Thomson. Uniformly yellowish testaceous, except the mandibles, eyes, first four abdominal segments, upper surface of posterior femora, and the exterior halves of the posterior coxæ and metasternum, which are black or brownish-red.

Head with the front strongly transverse, moderately convex, feebly concave between the antennal tubercles, with a narrow, longitudinal groove extending from epistoma to occiput; surface sparsely, coarsely, irregularly punctate, sparsely clothed with short and long, erect, yellow hairs intermixed. Antenna two thirds as long as body, rather densely ciliate beneath; first joint subequal in length to the third, gradually expanded toward apex, the surface coarsely rugose; last joint sharply pointed at apex, rather densely pubescent.

Pronotum strongly transverse, equal in width at base and apex; sides feebly expanded at middle, feebly constricted near anterior margin, strongly constricted near base; disk feebly, broadly, transversely flattened anteriorly, strongly, transversely grooved near base; surface sparsely, coarsely, irregularly punctate, sparsely clothed with erect, inconspicuous hairs.

Elytra feebly expanded posteriorly, rather densely, coarsely, irregularly punctate over entire surface, the punctures dark and more or less confluent, very sparsely clothed with long and short, erect inconspicuous hairs.

Body beneath feebly, sparsely punctate or rugose, sparsely clothed with long and short, erect, fine hairs intermixed; last abdominal segment broad, broadly rounded at apex, longitudinally carinate at middle, and broadly depressed posteriorly.

Length, 10 millimeters; width, 3.5 millimeters.

Type locality.—Mount Kinabalu: Kiau.

Described from a single specimen collected at an altitude of 3,000 feet, May 2, 1929. This species resembles *discoidalis* Thomson, but it differs from that species in having the first four abdominal segments, the upper surface of the posterior femora, the exterior halves of the posterior coxæ, and the metasternum black or brownish-red, and the elytra clothed with inconspicuous pubescence.

83. **Eustathes moultoni** Aurivillius.

Mount Kinabalu, Kenokok, 3,300 feet, April 22, 1929, one specimen.

84. **Astathes nitens** Fabricius.

Mount Kinabalu, Kiau, 3,000 feet, April 12–16, 1929, three specimens.

85. **Astathes unicolor** Pascoe.

Kabayau, near Mount Kinabalu, 600 feet, May 9–10, 1929, three specimens; Mount Kinabalu: Kiau, 3,000 feet, April 1, 1929, one specimen.

86. **Astathes costipennis** sp. n.

Male.—Head, pronotum, scutellum, antennæ (except outer seven or eight joints, which are fuscous), and body beneath yellowish testaceous; elytra with the apical halves yellowish testaceous, the basal halves brownish-black or violaceous blue, with the sutural margins more or less testaceous; mandibles with the tips black.

Head with the front strongly transverse, feebly, broadly depressed between the antennal tubercles, with a narrow, longitudinal carina extending from epistoma to occiput, the carina strongly elevated behind the epistoma; surface irregularly punctate, more densely in front than on top, sparsely clothed with long, erect, fine, yellowish hairs.

Pronotum strongly transverse, slightly narrower at apex than at base; sides more or less constricted near base and apex, arcuately expanded at middle; disk uneven, rather deeply, transversely grooved along apical third and basal third, the central dorsal gibbosity strongly elevated, somewhat rounded in outline, prolonged in front to interrupt the anterior transverse groove, and impressed on each side anteriorly with a deep, horizontally directed pit; surface sparsely, coarsely, irregularly punctate, densely clothed with fine, erect, brownish hairs toward the sides, with a few scattered, erect hairs on the dorsal gibbosity.

Elytra rather densely, coarsely, irregularly punctate, densely clothed on basal halves with long, erect, black hairs, more sparsely clothed on apical halves with long, erect, yellowish hairs; each elytron with three more or less distinct, longitudinal costæ in addition to the one along the sutural margin.

Body beneath feebly punctate, sparsely clothed with moderately long, semierect, yellowish hairs; last abdominal segment broadly rounded at apex, broadly depressed in the female, but without depressions in the male.

Length, 10–14 millimeters; width, 4.5–5.5 millimeters.

Type locality.—Kabayau, near Mount Kinabalu.

Described from two males and three females (one male type) collected at the type locality at an altitude of 600 feet, May 9–14, 1929. There is a slight variation in the color of the specimens examined, the three female paratypes being slightly more reddish-brown than the males. This species is allied to *perversa* Gahan, but it differs from that species in having the underside of the body uniformly yellowish testaceous or reddish-brown, and the dark basal area not extending beyond the middle of the elytra.

87. **Astathes opalescens** sp. n.

Female.—Above and beneath uniformly dark reddish-brown, the elytra with a distinct opalescent reflection in certain lights; mandibles with the tips black.

Head with the front strongly transverse and convex, flat between the antennal tubercles, with a deep longitudinal groove on the front, and a strongly elevated longitudinal carina behind the epistoma; surface rather densely, irregularly punctate in front, more sparsely punctate on occiput, sparsely clothed with long, erect, yellowish hairs.

Pronotum strongly transverse, slightly narrower at apex than at base; sides more or less constricted near base and apex, arcuately expanded at middle; disk uneven, deeply, transversely grooved along apical third and basal third, the central dorsal gibbosity slightly elevated, flattened on top, somewhat rounded in outline, prolonged in front to interrupt the anterior transverse groove, and impressed on each side anteriorly with a deep, horizontally-directed pit; surface sparsely, irregularly punctate, very sparsely on gibbosity, sparsely clothed with fine, erect, golden yellow hairs, more densely pubescent toward the sides.

Elytra sparsely, coarsely, irregularly punctate, the punctures arranged more or less in longitudinal rows along the costæ, clothed with long, erect, golden yellow hairs, densely on the basal halves, more sparsely on the apical halves; each elytron with two distinct, longitudinal costæ in addition to the one along the sutural margin.

Body beneath feebly punctate, sparsely clothed with semierect, brownish-yellow hairs; last abdominal segment coarsely punctate, densely pubescent, broadly subtruncate at apex, with the surface broadly, deeply depressed.

Length, 14 millimeters; width, 6 millimeters.

Type locality.—Mount Kinabalu: Tenompok Pass.

Described from a single female collected at an altitude of 4,500 feet, April 19, 1929. This species is allied to *perversa* Gahan, but it differs from that species in being uniformly reddish-brown above and beneath, and by the elytra having a distinct opalescent reflection in certain lights.

XLI. SOME NEW PLATYPODIDÆ FROM BORNEO AND MALAYA.

By KARL E. SCHEDL.

Through the courtesy of the Imperial Institute of Entomology, I have been able to examine a great number of Platypodidæ from various localities. Numerous new species have been found and in the following pages some from Malaysia are described.

Genus **Platytarsulus** gen. n.

Head globose, eyes oval, antennæ with the scape club-shaped, the funicle consisting of two joints, the pedicle ball-shaped, the other joint rather long and strongly widened apically, the club small, compressed but not so flattened as in the other genera of the family, the inner face subconvex, polished, the outer covered with short yellow pubescence. Pronotum distinctly wider than the head, sides parallel, narrowed in front, the fore coxæ contiguous, the prosternum very long, scutellum not visible when viewed from above, mesocoxæ distinctly separated, metacoxæ very small and remote. The fore tibiæ very narrow, without any transverse ridges but with two marginal teeth and one apical spur, meso- and metatibiæ similar but with the dentation more feebly developed.

Platytarsulus cannot be associated with any other genus of the family although it doubtless belongs to the *Platypodidæ*. The structure of the antennæ, which is a very constant character in the family, probably will make it necessary to erect a new subfamily but this shall not be done until more material is available. Genotype, the following species:—

Platytarsulus marshalli sp. n.*

Reddish-brown 4.40 mm. long, 3.8 times as long as wide.

Front rather narrow, convex, much longer than wide, gradually rounded towards the vertex, coarsely densely punctured, punctures but little finer in front. *Pronotum* as wide as long, sides parallel, distinctly constricted in front, surface feebly convex, without median sulcus, shining, coarsely punctured, the punctures much more densely placed anteriorly, towards the constriction the punctures elongate, directed towards the antero-lateral corners of the pronotum. *Elytra* wider and nearly three times as long as the pronotum, cylindrical on the anterior two-thirds, oblique and shallowly depressed behind, sides parallel, feebly constricted towards the apex, apical margin transverse; striate-punctate, the striæ narrow, deeply impressed, the interstices flat and with strong uniseriate puncturation, base of the 2nd, 3rd, and 4th not widened nor elevated but with fine transverse rugosities, some specimens having the rugosities replaced by a few punctures, the oblique declivity distinctly opaque, the interstices flattening out towards the apical margin and each with a row of short reddish scales. The sex is not known but probably all the specimens are females.

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*This species has been named in honour of Sir Guy Marshall, Director of the Imperial Institute of Entomology.

Types in the possession of the Imperial Institute of Entomology and in my collection.

Malay States: Johore North, Kluang, ex "Kapur" logs, vi. 1933.

North Borneo: Bettotan, nr. Sandakan, 28, vii, 1927 (C.B.K. & H.M.P.).

Platypus (Crossotarsus) trepanatus Chap.

A long series of females of the little known *Crossotarsus trepanatus* Chap. in connection with the hitherto unknown male has proved that Chapuis misplaced this species. Up to the time of the publication of his monograph females with such peculiar characters of the front have been found only in species of the genera *Crossotarsus* and *Cenocephalus*. From this he must have concluded that such frontal characters do not occur in the genus *Platypus*. Since that time studies of the feeding habits of the *Platypodidæ* have been made and we know now that such extraordinary frontal characters can be expected in any genus of the family. They have been found in species of the genera *Crossotarsus*, *Cenocephalus*, *Mitosoma*, and to a certain extent in *Spathidicerus* and *Platypus*.

The general appearance of the male would justify its being placed in the fifth group of the genus *Platypus*, close to the *Platypi oxyuri*. The transfer from the group *Crossotarsi trepanati* is emphasized.

Platypus trepanatus Chap. (♂ nov.).

Male.—Black or nearly so, 5.6 mm. long, 3.0 times as long as wide.

Front broadly concave, subopaque, medially with a shining depressed puncture, surface finely and extremely densely punctulate, laterally below the articulation of the antennæ with a longitudinal impression towards the articulation of the mandibles which is also densely punctured; vertex separated from the front by a rather acute angle. *Pronotum* quadrate, femoral grooves hardly visible from above, surface shining, minutely reticulate, rather coarsely uniformly punctured, median sulcus short. Elytra wider

(19:17) and 2.18 times as long as the pronotum, sides parallel on the anterior three-fifths, narrowed behind, at the apex with a rounded process, cylindrical, behind the basal three-fifths gradually and feebly convex, near the apex obliquely truncate; disc shining, striate-punctate, the strial punctures irregularly biseriate, towards the base the striæ deeply impressed, subsulcate, on the first five striæ the punctures replaced by small granules, towards the declivity the striæ becoming uniseriate and the punctures decreasing in size, the first five interstices subcarinate near the base, flat behind, interstices 6, 7, 8 subconvex to flat throughout, all interspaces irregularly finely punctured, the ninth subcarinate and finely tuberculate throughout; declivity with the convex portion opaque, the striæ indicated by narrowly and shallowly impressed lines, interstices flat and rugose, eighth interstice carinate and finely serrate, oblique truncate face subconvex, irregularly tuberculate, each elytron separately narrowly rounded at the apex.

Types in possession of the Imperial Institute of Entomology and in my collection.

Malay States: Rotan Tunggal Forest Reserve, ex *Eugenia* sp., 20.2.33 (F. G. Browne).

Selangor: Rawang, ex *Gonostylus* sp., "Tembusu paya," 16.5.33, (C. O. Flemmich).

Platypus subaplanatus sp. n.

Male.—Blackish, shining, 5.90 mm. long, 3.30 times as long as wide. Somewhat similar to *P. trepanatus* Chap. but with different declivital armature.

Front flat, with a large longitudinal central impression, coarsely roughly punctured in front, coarsely wrinkled above, with a distinct tubercle on each side of the upper limit of the impression on a level with the upper third of the eyes; antennal scape longer than wide. *Pronotum* longer than wide (18:16), shining, regularly, rather coarsely punctured, femoral groove deep, its basal angle acute, median sulcus moderately long, wide and with a transverse oval space around it impunctate. *Elytra* wider (18:16) and 1.94 times as long as the pronotum, of the same general shape as in *P. trepanatus;* striate-punctate, the first striæ distinctly, the others feebly, impressed, strial punctures very small and uniseriately placed, interstices flat, the even ones subimpunctate, the others with a row of fine rather closely placed punctures; towards the apex the elytra not so strongly narrowed as in *P. trepanatus*, the oblique truncation larger, anterior to it on the convexity the strial punctures larger but shallow and disc-like; all interstices with a row of piliferous punctures, the truncate face opaque, very coarsely and densely punctured, emarginate at the suture, emargination triangular, each lobe with the inner edge pointed, the outer angle shorter, the margin between with one or two small serrations. *Abdomen* normal. *Types* in the possession of the Imperial Institute of Entomology and in my collection.

Malay States: Selangor, Ulu Gombak, 17th mile ex Leguminoseæ, 22.12.29, (M. L. Webber). Pahang, Belut Forest Reserve, ex Anonaceæ, 29.7.32, (F. G. Browne).

Platypus pseudocupulatus sp. n.

Male.—Reddish-brown, 3.58 mm. long, 3.6 times as long as wide. Of the same general appearance as *P. cupulatus* Chap.

Front flat, densely coarsely punctured, and finely reticulate. Pronotum longer than wide (12:10), shining, sparingly finely punctured, sometimes with a small group of larger punctures at the anterior extremity of the median sulcus. The declivity with the emargination very deep and wide, extending to the centre of the concavity.

Female more slender, with the front flat, separated from the vertex by an acute angle, with a few rather coarse punctures. The pronotum more slender than in the male, the median sulcus fine, long, extending to the centre of the pronotum, surrounded by a very elongate oval patch of fine punctures. Apart from remarkable variations which occur in the species of this group I have seen a number of specimens which eventually will have to be treated as new species. Knowing that the species are very plastic I hesitate to describe them when unique specimens are available only.

Types in the possession of the Imperial Institute of Entomology and in my collection.

Malay States: Selangor: Rawang, ex *Gonostylus* sp. "Tembusu paya," 16.5.33 (C. O. Flemmich); Sungei Buloh, ex Leguminoseæ, 27.12.29 (M. L. Webber); Kajang (in Bungalow), at light, March, 1928 (M. L. Webber).

Platypus pseudocurtus sp. n.

Female.—Dark reddish-brown, 4.85 mm. long, 3.00 times as long as wide. Closely allied to *P. curtus* Chap.

Front nearly flat, the epistomal margin shining and impunctate on its median two-thirds, remaining surface opaque, especially towards the vertex, densely punctured and with moderately long erect pubescence, the vertex separated from the front by an acute angle, the former subshining, with the median line acutely carinate, and with a lateral elevated polished ridge extending to the upper-inner margins of the eyes. *Pronotum* subquadrate, femoral grooves shallow, surface minutely reticulate, shining, finely and rather remotely punctured, median sulcus narrow, moderately long, surrounded by a cordiform patch of punctures, the basal half of the patch consisting of 6–8 large pore-like punctures, the apical half densely finely punctured, an arrangement which has not so far been met with in the family. *Elytra* wider (17:15) and 2.10 times as long as the pronotum, sides parallel, broadly rounded behind, cylindrical on the anterior two-thirds, convex behind; disc shining, striate-punctate, the punctures fine, as large as those of the feebly convex interstices, arranged in a single row but appearing rather confused owing to the irregularly biseriately placed intermedial punctures, base of the third interstice strongly widened, elevated and transversely rugose, base of interstices 4 and 5 similar but more feebly developed; declivity with the upper convex area rather irregularly covered with small setose granules, and with the striæ strongly but narrowly impressed, perpendicular apical face opaque, densely rugose.

Types in the possession of the Imperial Institute of Entomology and in my collection.

Malay States: Pahang, Mentakab, 2, ix, 33; Pahang, Tranum, ex *Shorea leprosula,* 5, viii, 32 (F. G. Browne); Johore North, Kluang, ex "Kapur" logs, vii, 33.

Platypus convexicauda sp. n.

Male.—Dark reddish-brown to black, 2.85 mm. long, 3.9 times as long as wide. A rather peculiar species which might belong in the *Platypi cupulati* group.

Front flat, shining, subimpunctate on the anterior half, finely and sparsely punctured above, towards the vertex gradually rounded. *Pronotum* 1.27 times as long as wide, lateral emarginations short and deep, surface shining, finely rather densely punctured, median sulcus long but inconspicuous. *Elytra* wider (24:22) and 1.9 times as long as the pronotum, cylindrical, truncate behind, the margin of the truncation acute, the face itself feebly convex, the lower border produced downwards and backwards and with a small subtriangular emargination at the suture; base carinate, disc striate-punctate, distinctly impressed in the first stria only, the other striæ with the punctures moderate in size and somewhat remotely placed; interstices flat, shining, densely finely punctured, especially on the sides where the strial and interstrial punctures are hardly separable; convex declivital face opaque, punctulate, rather densely covered with short erect scale-like hairs, with some indications of striæ, and with a minute tubercle on the third interstice shortly above the centre, the produced lower lobes opaque but impunctate.

Types in the Imperial Institute of Entomology and in my collection.

Malay States: Pahang, Jahit Forest Reserve, ex *Quercus* sp. 23.vi.32 (F. G. Browne).

Platypus effetus sp. n.

Male.—Reddish-brown, 5.62 mm. long, 3.10 times as long as wide. A single specimen, unfortunately in rather bad condition, in my own collection which I have left unnamed up to now and which originates from Borneo, agrees very well with a series of three specimens, females, obtained from the Imperial Institute of Entomology, and there is but little doubt that these two sexes belong to one and the same species. *P. effetus* m. should be placed in that section of the *Platypi sulcati* which shows a patch of densely placed punctures on the pronotum.

Front flat, antero-lateral margin feebly raised, subshining and reticulate, and with few coarse punctures, medially with an impressed striga, posterior two-thirds with a circular opaque area which is densely shallowly areolate, lateral and posterior surrounding portions shining and with few coarse punctures, vertex shining, subimpunctate. *Pronotum* quadrate, lateral emarginations feebly developed, surface shining, remotely but coarsely punctured and with long erect reddish hairs, median sulcus narrow and long, extending up to the centre, anterior to it a patch of very fine and deep punctures, the anterior margin of the latter remote from that of the pronotum, the patch longer than wide. *Elytra* wider and 2.1 times as long as the pronotum, sides parallel on the anterior half, narrowly rounded behind; cylindrical on the anterior two-thirds, convex, feebly aplanate up to the third interstice behind, disc striate-sulcate, the sulci feebly multipunctate; interstices strongly convex, subimpunctate, base of the second and third finely tuberculate, fourth interstice not reaching the base; on the declivity the sulci wider, opaque, the interstices narrower and each with a series of tubercles, those of the first and second being much smaller than those of the others, a large blunt spine on the third interstice near the apex.

Female.—Reddish-brown, 6.00 mm. long, 3.5 times as long as wide. *Front* somewhat more longitudinally depressed than in the male, shining, with a median impressed oval puncture, minutely reticulate and finely sparsely punctured on the anterior area, polished, with few coarse punctures and long erect hairs above, the lateral limitations of the depression more strongly raised. *Pronotum* longer than wide (17:15), lateral emarginations hardly visible when viewed from above, median sulcus long but feebly developed, anterior to it an oval patch of extremely densely placed punctures; remaining surface shining, polished, with scattered coarse punctures from which arise long erect hairs. *Elytra* wider (17:15) and 2.10 times as long as the pronotum, sides parallel on the basal three-fourths, rounded behind, cylindrical, obliquely convex on the declivity which commences at the apical third; apical face subperpendicular; disc shining, striate sulcate, sulci wide, strial punctures small and uniseriately placed; interstices convex, subimpunctate, except for the first which is narrow, shallowly areolate and with some coarse punctures, base of the third interstice widened and densely granulate, granulation extending to the very narrow second interstice, the fourth interstice also very narrow and with one series of small granules, fifth similar to the third; declivital convexity subopaque, with the sulci narrowed to form impressed striæ, each interstice with a series of very small setose granules, pubescence reddish-brown, apical face opaque and granulate.

Types in the possession of the Imperial Institute of Entomology and in my collection.

Borneo (♂) without further data. British North Borneo: Mt. Kinabalu, Kamborangah, 7,000 ft., ♀♀, 27, iii, 29 (H. M. Pendlebury).

Platypus vetulus sp. n.

Male.—Reddish-brown, 4.00 mm. long, 3.00 times as long as wide. Another species of the *Platypi sulcati* in which the patch of densely placed punctures is situated on the anterior half of the pronotum.

Front opaque, broadly depressed, densely coarsely punctured, from each puncture arising a moderately long reddish hair, those towards the vertex shorter and inclined. Vertex polished with few coarse punctures. *Pronotum* quadrate, lateral emarginations shallow, median sulcus long and hardly visible, near the anterior border a transverse oval patch of densely placed punctures, remaining surface shining, with scattered fine punctures. *Elytra* wider (40:35) and 2.10 times as long as the pronotum, sides parallel, feebly arcuate, narrowly rounded behind; cylindrical on the anterior two-thirds, convex behind, disc striate-sulcate, sulci moderately wide, strial punctures obscure; interstices convex and with scattered fine punctures, the base of the first strongly widened, third and fifth granulate, the fourth narrowed and uniseriately tuberculate behind; declivital convexity opaque, first and second striæ distinctly shallowly and closely punctured, first and second interstices narrowed, finely carinate, becoming obscure in the lower third of the convexity, remaining sulci more sharply defined, the interstices narrowly carinate, both bearing an uniseriate row of small granules, those of the interstices larger and with reddish setæ, the third interstice more strongly elevated and ending in the lower third of the convexity in a large tubercle from which a low ridge extends to the sides, the area below that ridge convex and shallowly densely punctured.

Types in the Imperial Institute of Entomology and in my collection.

Malay States: Johore North, Kluang, ex ' Kapur" vi, 33; Pahang, Semangkok Forest Reserve, 2,000 ft., ex Anonaceæ sp., 7.iv.33 (F. G. Browne).

Platypus partitus sp. n.

Male.—Reddish-brown, 3.00 mm. long, 3.1 times as long as wide. Closely allied to *P. vetulus* m.

Front broadly longitudinally depressed, subshining, densely closely and coarsely punctured, with inconspicuous reddish pubescence. *Pronotum* longer than wide (29:27), lateral emarginations moderately deep, median sulcus very long, well developed, extending beyond the centre, near the anterior border with a triangular patch of fine densely-placed punctures, remaining surface shining minutely and sparsely punctured, a row of coarse punctures along the anterior margin. *Elytra* wider and 2.1 times as long as the pronotum, sides parallel, rounded behind; disc striate-sulcate, strial punctures inconspicuous, interstices convex subimpunctate, base of the third with a very small punctures, the base of the second and fourth strongly narrowed and with a row of fine granules; declivity commencing at the apical third, convex, interstices at first narrowed, carinate and tuberculate, the 3rd to the 8th ceasing abruptly and so forming a transverse ridge, each with a small apical granule, that of the third interstice being larger than the others, the first and second interstices feebly elevated and not ending abruptly but gradually declivous, the apical depressed and convex portion opaque, with inconspicuous indications of striæ and a few minute granules of the first interspace.

Types in the Imperial Institute of Entomology and in my collection.

Malay States: Selangor, Ayer Itam, on "Sendok-sendok," vi.28 (M. L. Webber); Selangor, Rawang, on "Penarahan" logs, 27.iv.33 (C. Flemmich).

Crossotarsus cincinatus Chap. (♂ nov.).

Male.—Black, 6.59 mm. long, 2.95 times as long as wide. Of the general shape and sculpture of *C. lecontei* Chap., but without the tooth on the last abdominal sternite and without the lateral processes of the elytra.

Front flat, densely but shallowly areolate and opaque on the posterior two-thirds, sparsely coarsely punctured anteriorly, median carina feebly elevated anteriorly, continued as a wide shining line above. *Pronotum* quadrate, shining, moderately coarsely and rather sparsely punctured, punctures more densely placed along the posterior border and the side margins, median sulcus short, continued anteriorly as a feebly depressed line. *Elytra* but little wider and 1.85 times as long as the pronotum, sides parallel, feebly narrowed behind, apex transverse; disc striate punctate, punctures large but shallow, largest near the base, becoming smaller towards the apex, the striæ strongly impressed throughout, interstices subconvex, irregularly, finely but rather densely punctured, the first six interstices of equal length, the first slightly longer, all transverse at the apex and each with 2–3 yellowish bristles, the interstices 7 to 9 joined to form a subimpunctate plate at the apex and ending in an oblique process the inner edge of which is as long as the other interstices, the outer angle but little longer. Below the apices of the interstices with a narrow transverse furrow, the sutural angles of which are visible when viewed from above, the lateral processes triquetrous, the abdominal sternites convex and with dense reddish pubescence.

Types in the possession of the Imperial Institute of Entomology and in my collection.

Federated Malay States: Perak, Kampar, on " Meranti," 29.ix.27, Selangor, Ulu Gombak, ex Leguminoseæ, 22.xii.29, Negri Sembilan, Bukit Tangga, on 'Meranti" 16.vi.28, (all M. L. Webber). Pahang, Kuala Dong, ex *Coccoceras* sp. 24.viii.32 (F. G. Browne).

Crossotarsus ursus sp. n.

Male.—Dark reddish-brown, 4.85 mm. long, 3.1 times as long as wide. A very stout species of the *Crossotarsi subdepressi* group.

Front flat, very coarsely punctured, the punctures but little smaller in front and very densely placed above. *Pronotum* quadrate, femoral grooves short and moderately deep, surface of a silky appearance, with scattered minute punctures, median sulcus fine and long, with a shallow depression somewhat distant laterad to its anterior extremity. *Elytra* wider (16:14) and 2.4 times as long as the pronotum, widest at the middle, sides subparallel, slightly arcuate, feebly constricted behind, with the declivity convex, and with the lateral angles produced, pointed and directed downwards and backwards, as in *C. saundersi* and its allies; disc hardly noticeably lineate-punctate, first stria impressed, interstices flat, subimpunctate, base of the third widened and feebly elevated and with few minute punctures; declivital convexity with the striæ widened, the punctures very large and shallow, interstices feebly elevated and rugose, apical transverse impression narrow. Abdomen with the last three sternites coarsely punctured.

Female.—Very similar to the male, the only remarkable difference being in the elytral declivity and the abdominal sternites. The elytra are more strongly narrowed behind, the convexity more gradually declivous and therefore extending over a longer area, the lateral processes very small and blunt, the last three abdominal sternites more transversely convex and finely punctured. The male has the anterior margins of the 2nd, 3rd and 4th visible sternites thickened to form transverse ridges.

Types in the possession of the Imperial Institute of Entomology and in my collection.

British North Borneo: Mt. Kinabalu, Kamborangah, 7,000 ft., iii.29; Lumu Lumu, 5,500 ft., iv.29 (H. M. Pendlebury).

Crossotarsus obtectus sp. n.

Male.—Dark reddish-brown, 4.90 mm. long, 3.77 times as long as wide. I provisionally place this species in the *Crossotarsi subdepressi;* closely allied forms have not been described yet.

Front flat, opaque, with a fine median impressed strigæ, sparsely punctured, all punctures shallow, smaller and more densely placed above, impunctate on the median part of the anterior half. *Pronotum* longer than wide (13.5:12), femoral grooves deep, the posterior angles of them acute, surface shining, very finely and sparsely punctured, median sulcus fine and long, surrounded by a subcircular patch of deep rather large punctures. *Elytra* wider (13.5:12) and 2.50 times as long as the pronotum, widest at the middle, sides subparallel, slightly arcuate, transverse behind; very finely lineate-punctate, the first stria distinctly impressed, the strial punctures coarse, interspaces flat with scattered fine punctures, the base of the third but little widened, elevated and with few minute punctures; in the apical fourth feebly convex above and with a perpendicular shining transverse and very low impression below, the lateral angles but little produced, shortly within them a very slender long tooth on each side which is directed backwards and downwards, on the upper convexity the strial and interspacial punctures coarse, confused and with short yellow hairs, the lower margin of the lunate impression with the sutural angles feebly produced, the upper margin ceasing shortly before the suture in a small granule, the space of the first interstice therefore gradually declivous.

Types in the possession of the Imperial Institute of Entomology and in my collection.

British North Borneo: Mt. Kinabalu, Kamborangah, 7,000 ft., iii, 1929 (H. M. Pendlebury).

XLII. COLEOPTERES NOUVEAUX DE LA PRESQU'ILE MALAIS OU DE BORNEO.

Par M.Pic (*Digoin, France*).

Les insectes faisant l'objet de la présente note m'ont été communiqués par Mons. H. M. Pendlebury du Selangor Museum, Kuala Lumpur. Je possède des cotypes de *Macrocyphon minor* et *Scirtes luteomaculatus*.

Family HELODIDÆ.

Macrocyphon elongatum sp. n.

Grande, elongatum et angustatum, nitidum, sparse griseo pubescente, rufum. Capite robusto, dense granuloso, rufo, postice externe piceo notato, oculis nigris; antennis gracilibus, rufis; thorace breve et lato, lateraliter subarcuato, angulis anticis fere rectis, supra non regulariter convexo, pro parte elevato, dense granuloso, elytris thorace paulo latioribus, angustatis, parallelis, postice attenuatis, antice impressis, in disco breve costa latis, minute non dense punctatis. Long. 8 mm.

Voisin de *Macrocyphon pendleburyi* Pic (J. F. M. S. Mus., XVII, 1934, p. 562), s'en distingue par le prothorax (vu de dessus) moins arqué sur les côtés, la forme plus étroite et allongée des élytres.

North Borneo: Mt. Kinabalu, Lumu Lumu 5,500 feet, April 1929 (H. M. P.).

Macrocyphon minor sp. n.

Minutum, elongatum, sparse griseo pubescente, rufum, antennis nigris aut brunneis, ad basin rufis. Capite robusto, sat dense granuloso, oculis nigris; antennis gracilibus, bicoloribus; thorace breve sat lato, lateraliter subarcuato, supra sat regulariter convexo, angulis anticis paulo prominulis, sat dense granuloso; elytris thorace distincte latioribus, elongatis, parallelis, postice attenuatis, antice impressis, minute sat sparse punctatis. Long. 4–4.5 mm.

Très distinct du précédent par la petite taille, le prothorax presque droit sur les côtés, les élytres sans trace de costules.

North Borneo: Mt. Kinabalu, Kamborangah 7,200 feet, March-April 1929 (H. M. P.).

Pherocladus* **singularicollis** sp. n.

Elongatus, parum nitidus, breve non dense griseo pubescens, rufus, elytris pro parte brunneis (antennis

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*Le groupe *Pherocladus* Frm. est représenté par les espèces à faciès de *Ptilodactyla* Ill. dont la partie antérieure du prothorax est avancée antérieurement en dessus de la tête.

fractis) articulo tertio piceo. Capite parum robusto, non dense granuloso, oculis nigris, grandis; thorace particulare, elongato, ante medium strangulato, antice late truncato et supra capite longe prominulo, dense granuloso; elytris thorace non latioribus, subparallelis et marginatis, postice attenuatis, minute non dense granulosis. Long. 5 mm.

Voisin de *P. castanescens* Pic, dont il est très distinct, à première vue, ainsi que des autres espèces du groupe, par le prothorax très étranglé avant le milieu et largement tronqué sur sa partie antérieure.

North Borneo: Bettotan, nr. Sandakan, July 1927 (C. B. K. & H. M. P.).

Ptilodactyla diversecostata sp. n.

Elongata, postice attenuata, nitida, griseo pubescens, rufo castanea, capite obscuriore, femoribus ad basin late tarsisque pro parte testaceis. Capite parum dense granuloso, oculis nigris, grandis, parum distantibus; antennis ♂ gracilibus, longe ramulosis; thorace breve et lato, antice valde attenuato, minute, antice dense postice sparse granuloso-punctato, antice supra subelevato, postice depresso et impresso; elytris thorace non latioribus, angustatis, postice attenuatis, inaequale costulatis, minute et sparse punctatis. Long. 6 mm.

Peut se placer près de *P. bogorensis* Pic, dont il se distingue, à première vue, par des élytres de forme plus allongée et ornés de côtés plus ou moins longues.

North Borneo: Mt. Kinabalu, Lumu Lumu 5,500 feet, April 1929 (H. M. P.).

Scirtes luteomaculatus sp. n.

Oblongus, antice et postice attenuatus, nitidus, minute griseo pubescens, luteus, pro parte rufus, elytris castaneis, signaturis luteis ornatis, antennis piceis, ad basin testaceis. Capite luteo, minute sat dense punctato, oculis nigris; thorace luteo, breve et lato, antice attenuato, minute non dense punctato; elytris lateraliter subarcuatis et paulo marginatis, postice attenuatis, minute et diverse punctatis, castaneis, ad suturam, ad basin et antice externe luteo marginatis et in singulo luteo multimaculatis: macula humeralis elongata, post basin maculis quadri et postmedium maculis quinque transverse dispositis, macula apicalis; pedibus luteis, femoribus apice brunneis; infra corpore flavo et rufo, pectore pro parte piceo. Long. 4 mm. (environ).

Voisin de *S. flavonotatus* Chp., mais avec des macules flaves bien plus nombreuses sur les élytres.

North Borneo: Mt. Kinabalu, Lumu Lumu 5,500 feet, April 1929 (H. M. P.).

Family DRILIDÆ.

Flabellotreta angustata sp. n.

Elongata, sat angustata, postice attenuata, griseo pubescens, parum nitida, brunnescens, pro parte testacea. Capite breve prominulo, dense punctato, oculis magnis, distantibus; antennis brunneis, ad basin pallidioribus, sat gracilibus, longe flabellatis; thorace breve et lato, antice fere recto, lateraliter postice paulo latiore, brunneo, lateraliter pallidiore, angulis posticis prolongatis, testaceis, supra inaequale, fortiter sat dense punctato; elytris thorace paulo latioribus, elongatis, postice attenuatis, dense punctatis, minute costulatis, brunneis, ad humeros testaceo notatis; pedibus gracilibus, brunneis, femoribus tarsisque pro parte testaceis; infra corpore testaceo. Long. 8 mm.

Espèce très distincte des autres du genre, en outre de la coloration, par le prothorax à bord antérieur presque droit, et la forme allongée des élytres.

North Borneo: Mt. Kinabalu, Marei Parei 5,000 feet, May 1929 (H. M. P.).

Family ANOBIIDÆ.

? **Lasioderma minima** sp. n.

Parva, oblonga, subopaca, griseo-holosericeo pubescens, rufa, oculis nigris, membris testaceis. Capite breve et lato, dense punctato, oculis distantibus; antennis testaceis, articulis penultimis paulo elongatis et latis, subtriangulatis, articulo ultimo elongato, postice attenuato; thorace parum elongato, antice attenuato, postice latiore, lateraliter fere recto, medio subconvexo, minute et dense punctato; elytris thorace paulo latioribus, brevibus, apice paulo attenuatis, lateraliter non rectis, humeris nullis, minute et dense punctatis, in disco vage et reducte substriatis, lateraliter postice minute unistriatis; pedibus brevibus, parum latis; infra corpore nitido, diverse punctato et parum pubescente, metasterno antice marginato et postice transverse sulcato. Long. 2 mm. (environ).

Cette espèce (douteuse pour le genre *Lasioderma* Steph.) se reconnaitra par son aspect peu brillant, les élytres vaguement substriés, le prothorax (vu de dessus) peu transversal.

Perak: Larut Hills 4,300 feet, February 1932 (H. M. P.)

XLIII. DIPTERA CALYPTRATÆ CHIEFLY FROM MALAYA AND NORTH BORNEO.

(Fourth Paper)*

By JOHN R. MALLOCH.

(Text-figures 1–20).

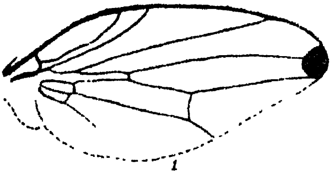
Family MUSCIDÆ.

Genus **Atherigona** Rondani.

This genus contains a very large number of species, all of them with one exception confined to the warmer parts of the Old World, the single exception being one in the Palearctic Region; and in the New World there is occasionally found one widespread Old World species that is apparently subject to considerable transportation through commerce because of the larval habit of feeding in decaying vegetable matter. The two species described below are distinct from any others known to me. Both belong to the group in which the male has a more or less pronounced concavity or depression on the dorsal surface of the fore femora near their apices, and no protuberence on the basal section of the hypopygium. The characters cited in the following descriptions should readily distinguish these two from any other already described species of the genus.

Atherigona ovatipennis sp. n. (Figs. 1 & 2)†.

Male.—Head testaceous yellow, densely yellow dusted, the occiput on upper half black, shining centrally, yellow dusted only on sides, interfrontalia brownish-black, orbits and a spot on each side of posterior ocelli on vertex densely yellow dusted; antennæ entirely black, aristæ yellow on basal halves, blackened beyond middle; palpi entirely black, the hairs fuscous. Thorax brownish-yellow, densely yellow dusted, the disc of the mesonotum much darker and with three dark brown to black vittæ, the central one linear, the other two much wider; disc of the scutellum dark brown all hairs and bristles black. Legs yellow, fore tibiæ infuscated from before middle to apices, fore tarsi blackened from extreme apex of first to apex of fourth segment. Wings hyaline, glassy, with a brown spot at apex as in Figure 1, the veins brown. Abdomen largely semipellucid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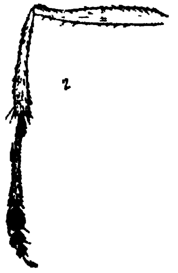
*Third Paper, Journ. F.M.S. Mus., XVI, 1930, pp. 119–153

† For explanation of text figures, see page 685.

yellow, much stained with water or grease in type so that it is impossible to determine the exact markings, but possibly dark marked on the apical three tergites. Squamæ and halteres brownish-yellow.

Head normal in form, the frons at vertex about one-fourth of the head width, widened anteriorly. Inner verticals shorter and stouter than usual, the other bristling as usual. Parafacial in profile linear, several shorter bristles close against the vibrissa. Some of the bristles in the upwardly curved series on upper half of the postocular orbits about as long as the outer vertical bristle. Third antennal segment broad, about six times as long as second: second segment of the arista about three times as long as thick, third thickened on basal third or less, minutely pubescent. Palpi longer than antennæ, densely short haired, slightly dilated at apices.

Thorax with only the two or three posterior pairs of the dorsocentrals evident, the anterior and presutural pairs not distinguishable from the short setulose hairs.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Fore legs as Figure 2; mid and hind tarsi not dilated, tapered to apices and with small claws; fore tibia without median bristles, mid tibia with one posterior submedian bristle; hind tibia with the usual three submedian bristles.

Wing as Figure 1, the surface hairs a little denser on the black apical spot than on area outside of it.

Abdomen stout, subcylindrical, tapered apically.

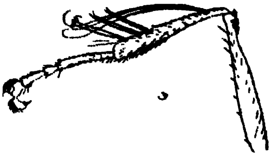
Length, 5 mm.

Holotype, Pahang, F.M.S.; Fraser's Hill, 4,000 feet, 26.i.1929 (H. M. Pendlebury).

The compressed fore tarsi, ovate wings, with the rounded costa and apical dark brown spot readily distinguish this species from its allies.

Atherigona pendleburyi sp. n. (Fig. 3).

In general appearance much as *ovatipennis*, but the apical dark spot on the costa of the wing is deeper black, confined to apex of the first posterior cell and is densely black haired, while the remarkable bristling of the fore tibia and the structure of the fore tarsi are unique in the genus. The only species that I have seen in which there is any bristling on the fore tibia is the Australian *tibiseta,* Malloch, and that is entirely different in other characters, including the unspotted wing.



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Head almost as in *ovatipennis*, but the apical section of the proboscis is shorter and stouter, the inner vertical bristles longer and finer, and the frons a little wider and shorter.

Thorax differing in having the central and lateral dark vittæ fused from a little behind suture to posterior margin.

Legs stouter than in the preceding species, the fore tibiæ almost entirely, and the entire tarsi of all legs, black. Fore legs as Figure 3. Mid and hind tarsi not as noticeably tapered apically and with larger claws.

Wings not as pronouncedly ovate, the costa less elevated basally, the apex of the first posterior cell narrower, and the inner cross-vein beyond middle of the discal cell.

Abdomen as in *ovatipennis*, but the stain not as dense, so that it appears as if most of the apical three tergites are blackened.

Length, 5 mm.

Holotype, ♂, Pahang, F.M.S.; Fraser's Hill, 4,000 feet. 25.i.1929 (H. M. Pendlebury).

I have been unable to determine if several females before me and taken at the same time and place as these males belong to either. I incline to place with *ovatipennis* one female that has the stigmatal bristle better developed than in the others, a feature that is to some extent noticeable in the males, but am not certain that I am correct in doing so, consequently I do not designate allotypes for either species though placing the specimens along with the types in the collection.

Genus **Lispocephala** Pokorny.

I have before me some species that I consider belong to this genus despite some divergent characters. There are one or two quite typical species of the genus in this region, but others depart more or less from these much as do some of those recorded from the Hawaiian Islands. I present below a key to the species available from Malaya.

KEY TO THE MALAYAN SPECIES.

1. Frons at vertex from one-fourth to one-third of the head width, with the grey dusted triangle extending to anterior margin, and the ocellar bristles usually well developed (Subgenus *Lispocephala*) 2.

Frons at vertex not over one-fifth of the head width, with the grey dusted triangle not extending beyond middle, and the ocellar bristles always reduced to short hairs (Subgenus *Cephalispa*, nov.) ....14.

2. Fore tibia with a well developed submedian posterior bristle; frontal orbits with three bristles each, the usual weaker second one from anterior extremity lacking; femora all partly fuscous, for coxæ and all the tibiæ and tarsi tawny yellow ....*tibiseta* sp. n.

Fore tibia without a submedian posterior bristle; each frontal orbit with three or four bristles........3.

3. Each frontal orbits with but three bristles, the anterior incurved one shorter than the anterior reclinate one: wing with a conspicuous brown or fuscous cloud on apical half or more of the costa; longest hairs on the arista about as long as its basal diameter..................................4.

Each frontal orbit with four bristles, the two anterior incurved, the second not nearly as long as the first; wings not distinctly clouded.............5.

4. Mesonotum obscured by dense grey dusting; costal cloud brown, extending from a little beyond level of outer cross-vein to apex; presutural acrostichals fine and short..................*tincta*, Malloch.

Mesonotum black, rather noticeably shiny, with even but not dense dark grey dust; costal cloud blackish, extending from furcation of second and third veins to wing tip, fading out at centre of wing before attaining third vein, more diffusely extended posteriorly beyond the outer cross-vein; presutural acrostichals irregular, one pair developed as short bristles..........................*tincta*, var. ?

5. Wing with a faint brown cloud on apical half costally; ocellar bristles represented by a pair of short fine hairs; legs fulvous yellow, apices of the hind femora and all of hind tarsi brownish or fuscous ....*subtincta* sp. n.

Wing not at all brown clouded apically; ocellar bristles well developed..................................6.

6. All coxæ and femora predominately black or fuscous; longest hairs on the arista barely longer than the basal diameter............................sp. 1.

Coxæ and femora entirely, or almost entirely fulvous to tawny yellow; longest hairs on arista usually almost as long as the width of the third antennal segment...................................7.

7. Hind femora with a small quite distinct fuscous apical mark above; apex of abdomen of male as Figure 4 ....*punctifemur* sp. n.

Hind femora entirely yellow......................8.

8. Hind trochanters of the male with a patch of dense short black spinules on the underside; apex of abdomen in that sex as Figure 8..*trochanterata* sp. n.

Hind trochanters of male with the usual more widely separated and longer fine black hairs..........9.

9. Fifth abdominal sternite of male with dense black bristles centrally at bases of the lateral arms (Fig. 9); longest hairs on arista not half as long as width of third antennal segment; the longer, lower, bristle on the anterodorsal surface of the hind tibia not as long as the preapical dorsal one; inner cross-vein of the wing about one-third from apex of discal cell, the penultimate section of fourth vein not half as long as ultimate section ....*indica* sp. n.

Fifth abdominal sternite of the male not densely bristled as above; longest hairs on arista over half as long as width of third antennal segment....10.

10. Superior hypopygial forceps of the male on entire dorsal surfaces with dense short soft black hairs (Fig. 5); antennæ black, second segment slightly brownish-yellow, third almost attaining level of vibrissæ, and about four times as long as second ....*pilifera* sp. n.

Superior hypopygial forceps of the male except on the apical slender portion with inconspicuous hairing; antennæ predominately yellow........11.

11. Basal pair of scutellar bristles not over one-third as long as the apical pair; lower squama not as large as the upper one, or subequal to it............. ....see Subgenus *Parvisquama* nov.

Basal pair of scutellar bristles about as long as the apical one; lower squama distinctly larger than the upper one.............................12.

12. Entire antennæ and basal two segments of the arista pale yellow; third antennal segment barely 2.5 times as long as second; processes of fifth abdominal sternite of male yellow, broad and glossy, with some moderately long bristly hairs on apical lower margin; wings with a faint but evident greyish suffusion along the second to fourth veins apically and on outer cross-vein....*nebulosa* sp. n.

At least the apical half or more of the third antennal segment brown or fuscous; this segment at least three times as long as second; wings without any trace of a dark suffusion along the veins apically..................................13.

13. Lateral arms of fifth abdominal sternite of male with dense microscopic pile on the outer margin apically (Fig. 7).........................*pilosa* sp. n.

Lateral arms of the fifth sternite without pile on any part of the exposed surface (Fig. 6)...*nuda* sp. n.

14. Thorax black or fuscous, densely grey dusted, the scutellum entirely dark and concolorous with the mesonotum; male abdomen at apex as in Figures 11–13........................*selangor* sp. n.
curva sp. n.
lata sp. n.

Thorax testaceous yellow, disc of the mesonotum and of the scutellum fuscous, and dark grey dusted; apex of abdomen of the male as Figure 10 ....*scutellata* sp. n.

It must be noted here than to a large extent this key is based upon males only, the hypopygia in this sex furnishing the most reliable differentiating specific characters. The females may in some cases be placed approximately by the use of the key, but in some species this sex is unknown to me and care must be exercised in making identifications of females. It is extremely unlikely that all the species that occur in this region are before me and further additions are certain.

Lispocephala (Lispocephala) tibiseta sp. n.

Female.—A quite typical species, much like *erythrocera* of Europe, but the frons is almost entirely densely silvery grey dusted, the usual black lines between the orbits and the triangle anteriorly very faint, almost as densely dusted as the triangle and orbits; antennæ and palpi testaceous yellow, third segment of the antennæ slightly darkened apically, the aristæ black. Thorax dark grey dusted, without dark vittæ. Abdomen testaceous yellow, blackened apically, the dark part grey dusted and the second and third visible tergites each with a pair of black spots and a much fainter dark central line. Legs testaceous yellow, fore femora and mid and hind coxæ almost entirely, mid and hind femora on the apical half or more, blackened, tarsi not infuscated. Wings greyish hyaline veins pale brown. Squamæ yellowish-white. Halteres yellow.

Frons at vertex fully one-third of the head width, narrowed slightly in front, slightly longer in centre than its greatest width, each orbit with but three bristles, the one nearest antennæ incurved and shorter than the anterior reclinate one, triangle attaining anterior margin; ocellars longer than upper orbital. Antennæ with the third segment about three times as long as second; arista very short haired.

Thorax with the anterior presutural dorsocentrals very short, the acrostichal hairs short and sparse.

Legs normal, fore tibia with a rather long median posterior bristle; mid tibia with a median posterior bristle; hind tibia with one anteroventral, two anterodorsal, and two posterodorsal, bristles.

Costal spine short but distinct; inner cross-vein at middle of discal cell, penultimate section of fourth vein over half as long as ultimate one.

Length, 4 mm.

Holotype, Pahang, F.M.S.: Gunong Tahan Padang, 5,500 feet, 24.i.1923 (H. M. Pendlebury).

Lispocephala (Lispocephala) subtincta sp. n.

Female.—Very similar to *tincta*, Malloch, differing in having the wings less distinctly brown marked at apex on costa, the abdomen more darkened apically, the hind femora with a small but distinct dark apical mark above, the ocellar bristles represented by minute fine hairs, and the second orbital bristle from the front present and rather strong, while the first one is stronger and longer than the anterior reclinate one.

Head black, densely yellowish-grey dusted except on the interfrontalia, the latter distinct between the triangle and the orbits, the triangle attaining the anterior margin. Frons at vertex slightly less than one-third of the head width, becoming wider anteriorly. Longest hairs on the arista almost as long as width of the third antennal segment.

Thorax black, densely dark grey dusted, with traces of three narrow dark vittæ on mesonotum. Bristling as in *tibiseta*.

Legs fulvous yellow, apices of hind femora narrowly, and all of hind tarsi, fuscous to black. Fore tibia without a median posterior bristle; mid tibia lacking.

Costal spine short; ultimate section of fourth vein almost twice as long as penultimate.

Abdomen orange or fulvous yellow, slightly darkened apically, with a pair of black spots and a less distinct central dark line on third and fourth tergites.

Length, 5 mm.

Holotype, Pahang, F.M.S.: Gunong Tahan Padang, 5,500 feet, 16.i.1923 (H. M. Pendlebury).

Paratype, Selangor: Bukit Kutu, 3,500 feet, 14.ix.1929 (H. M. Pendlebury).

Lispocephala (Lispocephala) nebulosa sp. n.

Male.—A teneral specimen, which has the wing veins with a faint but evident greyish suffusion along their courses, the antennæ and legs entirely yellow, and the abdomen yellow at base, darkened from middle to apex and with the usual paired black spots and dark central vitta on the third and fourth tergites. In its structure this specimen is quite similar to the female described above, but the orbital bristles are weaker, and the ocellar bristles are quite long, though not very strong. The apex of the abdomen is very similar to that of *scutellata*, the fifth sternite being almost identical in profile, but the processes are sharp on their entire inner edges while in *scutellata* there is a distinct thickening on the inner side of each near its middle. The fore tibia has no submedian posterior bristles, the mid tibia has but one posterior bristle, and the hind tibia has the usual five bristles. The wings are longer and narrower than usual in this subgenus, the apical section of the fourth vein being distinctly longer than the width of the wing at centre.

Length, 5 mm., wing 5.5 mm.

Holotype, Mt. Maquiling, Philippine Islands (Baker).

This specimen was sent to me about eight years ago by the collector and is in my collection.

Lispocephala (Lispocephala) sp. 1.

I am rather doubtful of the identity of this species though I am inclined to consider it is *erythrocera*, Robineau-Desvoidy, as the two females before me are in nearly every character identical with American examples of that species. I consider it wise to avoid giving a definite opinion in the absence of males as there are several closely related species in this group.

Pahang, F.M.S.: Gunong Tahan Padang, 5,500 feet, 9.i.1923 (H. M. Pendlebury); Baguio, Benguet, Philippine Islands (Baker).

Lispocephala (Lispocephala) punctifemur sp. n. (Fig. 4).

Male and Female.—A quite typical-appearing species of the genus, with the antennæ, palpi, and legs, fulvous or tawny yellow, the mid and hind coxæ black, densely grey dusted, and a dark brown spot at apices of the hind femora, most distinct above. The thorax is densely pale grey dusted so that the black ground colour is entirely obscured, the frontal triangle is densely grey dusted and carried to the anterior margin, and the abdomen is more or less tawny yellow, sometimes almost entirely so except the three pairs of black dorsal spots. Wings hyaline.

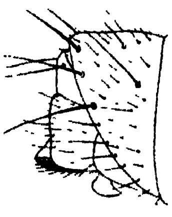
The longest hairs on the arista are about as long as the width of the third antennal segment, the frons at vertex is a little less than one-third of the head width. widened to anterior margin, and a little longer than its greatest width, with all the bristles present, the second incurved pair not as long as the ocellars.

Thorax normal, the anterior pair of presutural dorsocentrals about one-third as long as the next pair, basal pair of scutellars fully as long as the apical pair.

Legs normal. Fore tibia without a posterior submedian bristle, the other tibial bristles as usual, the one at middle of the anterodorsal surface and the preapical dorsal one on the hind tibia each about half the tibial length; hind trochanters not exceptionally armed.

Wings normal, outer cross-vein a little beyond middle of discal cell.

Abdomen of the male in profile as Figure 4.



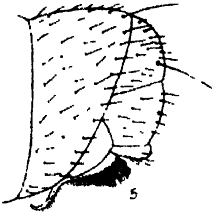
Squamæ yellowish-white. Halteres yellow.

Length, 3.5–4.5 mm.

Holotype ♂, Kedah Peak, 3,000 feet, 13.iii.1928. Allotype, Pahang, F.M.S.: Fraser's Hill, 4,000 feet, 26.i.1929. Paratype females, Selangor: Bukit Kutu, 3,500 feet, 18.iv. 1926, and 9.x.1929 (H. M. Pendlebury).

Lispocephala (Lispocephala) pilifera sp. n. (Fig. 5).

Male.—A rather larger and more slender species than the next preceding one, with the legs longer, and entirely yellow, including all coxæ, the antennæ longer, black except the apex of the second segment, the face appearing deep black when seen from most angles, but showing brownish-grey dusted when seen from the side. The interfrontalia also shows as a black line on each side of the triangle in front.



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In structure the distinctions lie in the longer antennæ, the third segment being about four times as long as the second, much as in *pilosa*, and the abdomen is more nearly cylindrical, with the apex as in Figure 5, the dense soft black hairs on the dorsal surface of the superior hypopygial forceps being unique in the genus as far as I have seen. The armature of the legs is as in *punctifemur*.

Length, 4.5–5 mm.

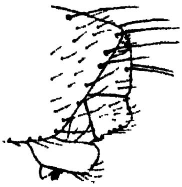
Holotype, and two paratypes, Kedah Peak, 3,300 feet, 16, 19, and 22.iii.1928 (H. M. Pendlebury).

I am placing with this species a number of females, from the localities mentioned below, that differ in having the third antennal segment largely yellowish basally and the upper central part of the face and a streak down along each side of the central plate almost to the vibrissæ black. I believe I am correct in placing these females here but more material is a requisite for accurate identification.

Kedah Peak, 3,000 feet, 8–18.iii.1928; Selangor: Bukit Kutu, 3,500 feet, 16, 20.iv.1926; Pahang: Fraser's Hill, 4,000 feet, 25.i.1929 (H. M. Pendlebury).

Lispocephala (Lispocephala) nuda sp. n. (Fig. 6).

Male.—Very similar to *pilifera*, differing in having the third antennal segment tawny yellow on the basal half, the face entirely yellow dusted, and the apex of the abdomen as in Figure 6, the superior hypopygial forceps with sparse hairs basally and with a few microscopic erect hairs apically on dorsal surfaces.



Length, 5–5.5 mm.

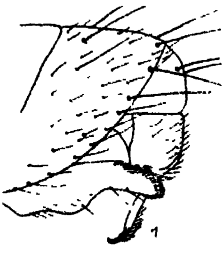
Holotype, Pahang, F.M.S.: Fraser's Hill, 4,200 feet, 7.vii.1931. Paratypes, Perak, F.M.S.: Larut Hills, 3,700 feet, at light, 12.ii.1932, and 3,700–4,000 feet, 11.ii.1932.

Several females that I place here have no distinct black lateral stripe on each side of the centre of face.

These specimens from Pahang and Selangor may belong to either this or the next species.

Lispocephala (Lispocephala) pilosa sp. n. (Fig. 7).

Male.—Another species very similar in all details to the preceding two, more nearly like *nuda* than *pilifera*, having the third antennal segment broadly yellow at base and the superior hypopygial forceps sparsely haired dorsally. The main distinction between this species and *nuda* is found in the dense pile on the outer apical portions of the lateral arms on the fifth abdominal sternite of the male as shown in Figure 7. This may appear a rather trivial character to separate species upon but I have found the form and armature of this particular abdominal sternite to be of great value for this purpose and there is but little variation in it in any species known to me.



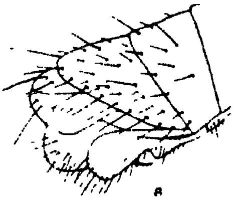
Length, 5 mm.

Holotype, Pahang, F.M.S.: Fraser's Hill, 4,000 feet, 29.i.1929 (H. M. Pendlebury).

Lispocephala (Lispocephala) trochanterata sp. n. (Fig. 8).

I have before me a pair mounted on the same piece of pith that apparently belong to the same species though there is a difference in the colour of the legs, the male having them entirely orange-yellow while in the female the mid and hind coxæ are fuscous and grey dusted and the apical halves of the hind femora are infuscated.

In structure the species is very close to *nuda*, but the aristal hairs are a little shorter, while the male has several characters that distinguish it from any other known to me. In that sex the hind trochanters are furnished on their lower surface with a patch of short densely placed stiff hairs of bristles, the hind femur has two or three shorter and stronger bristles than usual at the base of the posteroventral series, and the apex of the abdomen is different from that of any other species of the genus now before me, the fifth sternite in particular being quite distinctive (Fig. 8).



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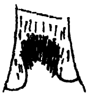
Length, 3.5–4.5 mm.

Holotype and allotype, Gunung Singgalang, West Coast of Sumatra, 1,800 m., 1925 (E. Jacobson).

Lispocephala (Lispocephala) indica sp. n. (Fig. 9).

Male.—I am describing as new a species that agrees very well with the female listed above as No. 3, having the same general colour and markings, but I do not care definitely to associate them as the same species without males of the one from Malaya before me. The present specimen will run down to the same place in the key as No. 3, having the legs entirely orange-yellow, even the mid and hind coxæ being of that colour as are the palpi and the antennæ, though the third segment of the latter in the type specimen is slightly darkened apically. The longest hairs on the arista are about twice as long as its basal diameter, which is shorter than in No. 3. The fifth abdominal sternite of the male is different from that of any species of the genus known to me, there being dense short stiff hairs present centrally at the bases of the processes (Fig. 9). The legs are normal in bristling and structure, similar to those of *erythrocera*, and the costal thorn is not developed.



Length, 5 mm.

Holotype, Peshawar, S. India, 19.iii.1913 (F. M. H.). Sent to me from Coimbatore several years ago, by Ramachandra Rao.

Subgenus **Cephalispa** n.

I have separated from the typical species of *Lispocephala* a segregate to be known under the above subgeneric name in which the following are the distinguishing characters: Frons much narrower than in the typical forms, at vertex not over one-fifth of the head width, widened to anterior margin, the ocellar bristles usually reduced to short fine hairs; anterior pair of presutural dorsocentral bristles always very small, sometimes lacking; mid tibia with two posterior bristles, one near basal fourth, the other close to middle; lower calypter about 1.5 times as large as upper. Type species, *Cephalispa scutellata* sp. n.

Lispocephala (Cephalispa) scutellata sp. n. (Fig. 10).

A testaceous yellow species, with the upper half of occiput grey, the disc of mesonotum broadly fuscous, and brownish dusted, with faint traces of darker vittæ, the disc of the scutellum similar to that of mesonotum, its margin yellow, the abdomen with a faint brownish central vitta of variable extent, and paired black spots on one to three of the tergites, usually on three in the male, the legs entirely yellow, and the wings hyaline.

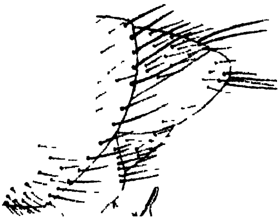
Frons at vertex not one-fifth of the head width, gradually widened to anterior margin, its length in centre about 2.5 times that of its width at anterior reclinate bristle, the upper reclinate bristle the shortest of the four orbitals, one or two fine hairs between the bristles; ocellars much shorter and finer than the postverticals. Antennæ extending to lower third of face, third segment over twice as long as second; arista with the second segment rather abnormally thickened and twice as long as thick, the longest hairs on third distinctly longer than the width of third antennal segment. Parafacial in profile linear, gena not as high as width of third antennal segment but higher than width of parafacial; one or two short bristles above the vibrissa.

Thorax with the usual bristling, the anterior pair of presutural dorsocentrals very small.

Legs with the usual bristling, the ventral surfaces of the femora on their basal halves rather more hairy than usual, the fore pair in the female with the armature consisting of minute black spinules that are much stronger than in the male.

Upper costal spine longer than lower one, but not very conspicuous; inner cross-vein at middle of discal cell and almost directly below apex of first vein; penultimate section of fourth vein about two-thirds as long as ultimate one.

Abdomen stout, in the male with the second and third tergites on central line subequal in length, combined hardly longer than fourth, the latter hardly longer than fifth, the apex as in Figure 10.



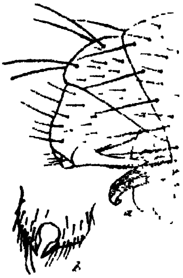
Length, 5–6 mm.

Holotype ♂, Pahang, F.M.S.: Fraser's Hill, 4,000 feet. 2.ii.1929 (H. M. Pendlebury). Allotype, Mt. Maquiling, Luzon, Philippine Islands (Baker), in my collection.

Lispocephala (Cephalispa) selangor sp. n. (Fig. 11).

This species is much darker and more slender than *scutellata*, the thorax being entirely dark with dense grey dust, the scutellum without and pale margin, and the fifth abdominal sternite of the male very different in structure. The fore femora of the female have much finer hairs on the ventral surface and they do not extend as far towards the middle. The aristal hairs are also shorter, the longest being just about as long as the width of the third antennal segment, and the latter is more noticeably pilose.

There are three closely allied species in my material that may be separated on the basis of the structure of the fifth abdominal sternite and the hypopygium of the males. I figure *selangor* in profile (Fig. 11), and in addition to the different structure of the internal hook (*a*) would draw attention to the fact that the outer side of this organ is rather densely short haired which hairs are lacking in the other two species. In the only male of *selangor* available the fore tarsi are fuscous or almost black, while in the other two species they are not, or very little, darker than their tibiæ. The female of *selangor* has the fore tarsi a little darker than their tarsi.

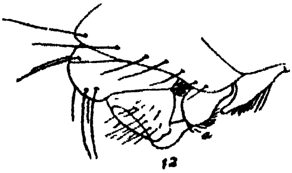


Length, 5–6 mm.

Holotype ♂, Selangor: Bukit Kutu, 18.iv.1926, 3,500 feet. Allotype and three female paratypes, same locality, 20.iv.1926. Paratypes, ♀ same locality, 9.xi.1924, 10.ii. 1932; Kuala Lumpur, 17.i.1932, at light; ♂, Pahang, Fraser's Hill, 4,000 feet, 31.v.1932. All collected by H. M. Pendlebury.

Lispocephala (Cephalispa) lata sp. n. (Fig. 12).

Male.—Similar to *selangor*, differing in having the fore tarsi pale, and the internal process of the hypopygium (*a*) broadly rounded in profile and setulose along the outer edge (Fig. 12).



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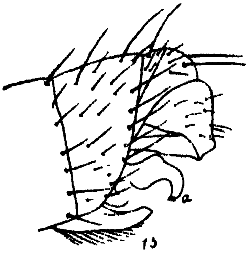
Length, 5 mm.

Holotype, Selangor: Bukit Kutu, February 1903 (Dr. H. E. Durham).

Type belongs to the British Museum.

Lispocephala (Cephalispa) curva sp. n. (Fig. 13).

Similar to the two next preceding species, but the fifth sternite and the hypopygium are different, the internal process (*a*) being more curved than in *selangor*, and without dense hairing on the outer side (Fig. 13).



Length, 5–6 mm.

Holotype, ♂, allotype, and two male paratypes, Baguio, Benguet, Luzon, Philippine Islands (Baker).

Type and allotype in my collection, paratype sent to the British Museum.

I have seen two females of a species from Sumatra.

Lispocephala (Cephalispa) uniseriata sp. n.

Female.—Head brown, densely grey dusted except on the interfrontalia, the antennæ and palpi orange-yellow, second segment of the former slightly darkened above. Thorax black, densely grey dusted, humeri, propleura, and upper and posterior margins of the sternopleura, orange-yellow; mesonotum with three dark vittæ, the central one linear in front of suture, connecting with a transverse dark band at latter, and with the sublaterals much wider behind suture; scutellum slightly yellowish below at apex. Abdomen yellow at base, black beyond, densely grey dusted, with a black dorsocentral stripe and two spots on each side of it on the second to fourth tergites. Legs yellow. Squamæ yellowish-white. Halteres yellow. Wings yellowish hyaline, veins brown.

Frons as in *scutellata*, but the ocellars are undeveloped. Longest hairs on the arista fully as long as width of third antennal segment, the latter about three times as long as second, falling distinctly short of epistome.

Anterior pair of presutural dorsocentrals about one-third as long as next pair; the acrostichal setulæ in a closely placed single series from near suture to anterior margin; scutellars subequal.

Legs normal, with the same bristling as the other two species, the mid femur with as usual but one preapical posterodorsal bristle; and the fore femora with the ventral surface weakly setulose as in *selangor*.

Inner cross-vein of the wing very slightly beyond middle of the discal cell.

Length, 6.5 mm.

Holotype, Selangor: Bukit Kutu, 3,300 feet, 10.ii.1932 (H. M. Pendlebury).

The uniseriate presutural acrostichals and distinctively though inconspicuously vittate mesonotum, and the nature of the ventral armature of the fore femora, are enough to distinguish this species from the two other species of the subgenus known to me. I have not included this species in the key as I do not have a male before me.

Subgenus **Parvisquama** n.

I describe below three species that I place in a subgenus distinguishable from *Lispocephala* and *Cephalispa* by the much smaller lower squama, this being not as large as the upper one. In other characters the group is very close to *Lispocephala*, the mid tibia having but one posterior bristle and the hind tibia five bristles. The frons is variable in the three species now placed herein, one having the triangle not extending to middle, the other two having it carried to the anterior margin. In the armature of the frons there is little variation, all having the ocellars well developed, and all but the male of one species having the four pairs of orbitals distinct. Type species, *Lispocephala* (*Parvisquama*) *pahangensis* sp. n.

KEY TO THE SPECIES.

1. Basal pair of scutellar bristles less than one-third as long as the apical pair; legs entirely yellow; antennæ short, falling well short of attaining vibrissal level, the third segment hardly more than twice as long as second and noticeably tapered, almost pointed, at upper apical angle .... *inæqualis* sp. n.

   Basal and apical pairs of bristles subequal in length; other characters not as above .... 2.

2. Frontal triangle densely grey dusted and well distinguished from the black interfrontalia, not extending to beyond middle; legs including the coxæ yellow; fifth abdominal sternite of the male as Figure 15 .... *sumatrana* sp. n.

   Frontal triangle not as above, carried to anterior margin of frons; legs with the coxæ and femora black .... 3.

3. Frontal triangle densely grey dusted, showing in sharp contrast to the black interfrontalia, and reduced to a mere line on its anterior third or more; abdomen shining black, with very slight trace of dusting, and without any markings; squamæ and knobs of halteres fuscous......*nigriventris* sp. n.

Frons entirely dusted, the triangle not readily distinguishable from the interfrontalia, wide in front; abdomen black, with dense grey dust, each tergite from second to fourth with a pair of black spots and a black central vitta; squamæ yellowish-white; knobs of halteres yellow.......*pahangensis* sp. n.

Lispocephala (Parvisquama) pahangensis sp. n. (Fig. 14).

Male and Female.—Black, densely grey dusted, the antennæ except apex of second segment, palpi, and legs except the tibiæ basally, black. Frons of the male silvery white dusted, the triangle broad and difficult to distinguish except from certain angles, the orbits yellowish-grey dusted; frons of female yellowish-brown dusted, the triangle from in front of the ocelli almost black when seen from the side, paler when seen from in front when the entire frons appears brownish-yellow dusted. Thorax densely grey dusted, the disc of mesonotum broadly brown, without distinct vittæ. Abdomen densely grey dusted, second to fourth visible tergites in the male each with a pair of black spots, the first in female also with a smaller pair. Legs black, tibiæ basally yellow, sometimes almost entirely pale. Wings hyaline. Squamæ yellowish-white. Knobs of halteres yellowish-brown.

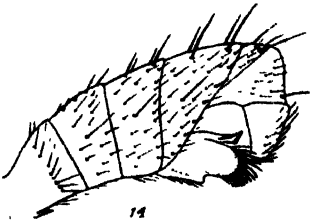
Head as wide as high seen from in front; frons at vertex about one-fourth of the head width, almost parallel-sided, about 1.5 as long as wide at centre, the orbits much narrower than the interfrontalia. Outer vertical bristles much shorter than the inner pair, upper reclinate pair shorter than second, the anterior incurved pair a little longer than the anterior reclinate pair, the second incurved pair minute, sometimes possibly lacking. Antennæ falling slightly short of level of vibrissa, the third segment rounded at apex and about twice as long as second; longest hairs on arista about half as long as width of third antennal segment; palpi of moderate length; parafacial in profile linear; gena hardly higher than width of parafacial.

Presutural anterior dorsocentral bristles minute; other bristling as in the typical *Lispocephala* species.

Legs normal. Mid femur with three long bristles on apical half of the anterior surface, and one or two on basal half of the posteroventral; fore tibia without a submedian posterior bristle; mid tibia with a submedian posterior bristle; hind tibia with the usual five bristles, the one near middle on the anterodorsal surface much the longest.

Wings quite broadly rounded at apices, the tips of third and fourth veins in vertical line; inner cross-vein at middle of discal cell; penultimate section of fourth vein about two-thirds as long as ultimate one; costal thorn not distinct.

Abdomen of female broadly ovate, that of the male cylindrical at base, much compressed and thickened apically (Fig. 14).



14

Length, 4–4.5 mm.

Holotype ♂, Pahang, F.M.S.: Gunong Tahan, Seat Point, 5,640 feet, 17.i.1923. Allotype, Pahang, Gunong Tahan Padang, 5,500 feet, 19.xii.1921. Taken by H. M. Pendlebury.

It may be noted here that the small heavily sclerotized bare process on the outer side of each arm of the fifth sternite in the male, shown in the figure, is apparently analogous to the more slender haired one present in *sumatrana*.

Lispocephala (Parvisquama) nigriventris sp. n.

Female.—An entirely black species, the tibiæ more brownish than the femora, with the frontal triangle dark grey dusted and showing in sharp contrast to the black interfrontalia, much narrower than usual, tapering into a fine line on its anterior third where it is hardly visible. The dust on the thorax is brown, and the abdomen lacks distinct dust and markings.

The frons at vertex is slightly narrower than in the next preceding species, the four pairs of orbital bristles are all quite long and strong, the upper pair being stronger than the ocellars, the arista is a little longer haired, the third antennal segment is about three times as long as second, the parafacials are almost invisible in profile, and the gena linear.

Bristles and hairs on thorax stronger than in *pahangensis*.

Wings more pointed, the fourth vein with its apex proximad of apex of third, not directly in vertical line with it. Squamæ and halteres fuscous.

Length, 5 mm.

Holotype, Pahang, F.M.S.: Fraser's Hill, 4,000 feet, 25.i.1929 (H. M. Pendlebury).

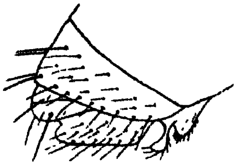
Lispocephala (Parvisquama) sumatrana sp. n. (Fig. 15).

Male and Female.—A black, densely grey dusted species, with black antennæ and palpi, and entirely yellow legs. The thorax has traces of three narrow brown vittæ, the abdomen has three pairs of black spots and a dark central vitta on the dorsum, and the wings are hyaline.

Frons at vertex about one-fourth of the head width, widened in front and longer than wide, the orbits narrow, and the frontal triangle not traceable in front of middle. All the bristles well developed, normal in number and position. Third antennal segment about three times as long as second; longest hairs on the arista nearly as long as width of third antennal segment.

Legs normal. Mid femur with one or two bristles near middle and one near apex on anterior surface, and one long bristle near middle of posteroventral surface. The tibial armature as in the other species, the bristle at middle on posterodorsal surface of hind tibia longer than usual but not as long as the one on the anterodorsal surface.

Wings hyaline, veins yellowish-brown. Apex as in *nigriventris*, the fourth vein with its tip proximad of level of third, and the inner cross-vein slightly proximad of middle of discal cell.



15

Abdomen not as much compressed and dilated at apex as in *pahangensis* (Fig. 15), the short outer process on each lateral arm of the fifth sternite spatulate and with some marginal hairs at apex.

Length, 3.5 mm.

Holotype ♂, Fort de Kock, Sumatra, 920 m., 1924. Allotype, topotypical, 1925 (E. Jacobson).

I have included this species in the present paper as it is not improbable that it will yet be found in the Federated Malay States.

Lispocephala (Parvisquama) inæqualis sp. n. (Fig. 16).

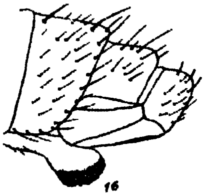
Male.—A black, densely grey dusted species, with entirely yellow legs, the frons with a grey dusted slender triangle extending to anterior margin, but greasy so that it is impossible to give accurate details, the antennæ fuscous, second segment at apex and third at base reddish-yellow, palpi fuscous; wings hyaline. The thorax has three narrow dark brown dorsal vittæ, the abdomen is yellow on each side at base and has a pair of large black spots on each tergite from second to fourth inclusive, with a central dark mark on the first two.

Head smaller than in the other species, with the antennæ shorter, the third segment falling short of vibrissæ, about twice as long as second and rather pointed at upper apical angle. Longest hairs on aristæ nearly as long as width of third antennal segment. Frons at vertex a little less than one-third of the head width, longer than wide, the orbits distinct, each with four well developed bristles, the ocellars rather short.

Thorax with the anterior pair of presutural dorsocentrals undeveloped, the anterior pair of postsuturals shorter than the next pair, lower stigmatal bristle a mere hair, and the basal scutellar pair not one-third as long as the apical pair.

Legs rather slender, with the usual tibial bristles, which are not very strong, the mid femur with about four bristles along the anterior side.

Wings slender, not broadly rounded at apices, inner cross-vein slightly beyond middle of the discal cell.



16

Abdomen cylindrical, hypopygium as Figure 16; fifth abdominal sternite with a fringe of closely placed black bristly hairs along the inner side of each lateral arm.

Lower squama much smaller than the upper, yellowish-white. Halteres yellow.

Length, 3.5 mm.

Holotype, Perak, F.M.S.: Larut Hills, 3,700 feet, 6.ii.1932 (H. M. Pendlebury).

A very distinct species on account of the hypopygial and other characters.

Family CALLIPHORIDÆ.

Subfamily CALLIPHORINÆ.

Genus **Verticia** Malloch.

1927. Ann. and Mag. Nat. Hist., 20, 388.

When I described this genus I had before me three species, only one of them represented by both sexes. Since then I have obtained several additional specimens, including the male of *fasciventris* Malloch, and present below some additional data on the genus.

Verticia orientalis Malloch.

l.c., 390.

I add to the description the fact that in the male there are two long strong bristles at apices of the third and fourth sternites of the abdomen and that in the female there are also a few strong bristles on these and the next sternite though they are not as conspicuous.

Additional Malayan localities: Selangor, Kuala Lumpur, 14.v.1931, at light; and Kedah Peak, 3,000 feet, 18.iii.1928 (H. M. Pendlebury, F.M.S. Museums).

Type material sent to British Museum. Specimen to collector.

Verticia fasciventris Malloch.

l.c., 391.

I had only one female of this species when I described it and now have several more specimens including both sexes. The male shows the same sexual differences from the female as does that of the preceding species, the third antennal segment being comparatively longer, the head narrower, the parafacials with fewer series of short black bristles, and the costal vein without long bristles. As additional data I may cite the fact that the third and fourth sternites of the female are depressed or grooved longitudinally in centre and that there are some stout spines on each side at apices on the raised parts, most numerous on the fourth. The male has the abdomen with less distinct dark apical tergal fasciæ, the fourth with a pair of black spots at apex, no very strong apical bristles on any of the sternites, and a pair of prominent, yellow, heavily chitinized, hypopygial processes that are directed downward, almost angularly curved forward and without well developed bristles, somewhat resembling a boot or shoe.

Additional localities: ♂ and ♀, Langkawi Is., West Coast, Malay Peninsula, 26.iv.1928 (H. M. P.); 2 ♂♂, East Coast, P. Dayang, v.1927, (N. Smedley); ♀, Kedah, near Jitra Catchment Area, 4.iv.1928 (H. M. Pendlebury).

Type sent to British Museum with additional specimens except one retained, representatives of the species to be sent back to collector.

Verticia nigra Malloch.

l.c., 391.

Originally described from one female from Singapore and two from Selangor. I have to add to the distinguishing characters the fact that the third and fourth tergites in this sex are not channelled longitudinally in centre and that though there are a number of bristles on each side at apices these are very much weaker and more numerous than in the next preceding species.

Additional records: Selangor, Bukit Kutu, 3,500 feet, 19.iii.1931, and 9.ii.1929 (H. M. Pendlebury).

Type in collection of writer, other material sent to British Museum.

Genus **Hypopygiopsis** Townsend.

This genus contains large metallic blue flies, with strong, densely haired legs in the male, and all have the metathoracic convex area above the spiracle with long erect hairs. The postalar declivity, and an anterior and posterior sclerotized plate above the lower squama haired or bristled, and the lower squama bare above.

I have published a key to the species* and below merely record the occurrence of one species.

Hypopygiopsis metallica (van der Wulp).

My previously acquired male was defective, lacking most of the tarsi. Now I can state that this sex of *metallica* has all the metatarsi long haired, and the mid tibia with no stout apical spur, only an apical bristle being present.

Malay Peninsula, West Coast, Sembilan Islands, Pulau Rumbia, 20.iii.1926 (E. Seimund). Two males.

Genus **Calliphora** Robineau-Desvoidy.

Calliphora malayana Malloch.

This species is very close to *fulviceps*, van der Wulp, but there are usually two pairs of presutural acrostichals present, the anterior pair weak and fine, and the third antennal segment is quite distinctly reddish-yellow below and at the base. The fore coxæ, trochanters, and the apices of the femora below are usually rather distinctly reddish-yellow, and the dust on the fourth visible tergite of the abdomen is brownish and not white.

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*Ann. and Mag. Nat. Hist., p. 502, vol. 9, 1926.

B. N. Borneo: Mt. Kinabalu; at various elevations from 5,500 to 10,000 feet, March-April, 1929 (H. M. Pendlebury).

A remarkable fact is that in over 100 specimens fully 70 per cent. have one or more specimens of a bright orange-yellow coloured mite attached to or close to the prothoracic spiracles. The flaps of these spiracles are the same colour as the mite and it is difficult to detect the latter unless with a high power lens. I can find no mites attached to any other part of the thorax or abdomen. This consistent placement of the mites is I believe worth recording though why they attach themselves to this particular part of the insects is rather puzzling.

Calliphora atripalpis sp. n.

Female.—A species of the same group as *erythrocephala* Meigen, but with the antennæ, palpi, and all the cephalic hairs black, and the squamæ and their fringes dark brown. The presutural acrostichals are in two pairs and there are five bristles on the presutural lateral area. Tegulæ and basal costal scale black. First two visible tergites of abdomen without apical central bristles. Abdomen blue-green, undusted.

Length, 8 mm.

Holotype, B. N. Borneo: Mt. Kinabalu, Kamborangah, 7,000 feet, 3.iv.1929 (H. M. Pendlebury).

Genus **Dexopollenia** Townsend.

The two Malayan species of this genus described below differ from others in their much darker general colour, and noticeably in lacking the presutural pair of acrostichal bristles.

Dexopollenia hirtiventris sp. n.

Male.—Head black, reddish near vibrissal angles, with pale grey dust on the frontal orbits, face, raised part of genæ, and postocular orbits. Antennæ black, the basal two segments and base of third reddish-yellow; palpi dark brown, paler at apices. Frons linear on upper third, greatly widened to above antennæ, the orbits narrow, bristled from anterior extremities to linear part; ocellar, vertical, and postvertical bristles very small. Parafacials not as wide as third antennal segment, bare, or with one or two minute hairs on upper part; gena about one-fourth of the eye height, black bristled and haired; face slightly convex above, without a central carina; antennæ with the third segment about four times as long as wide, its apex extending to about the lower third of face above vibrissæ, the latter a little above epistome; arista plumose, eyes with the facets enlarged above in front.

Thorax black, dull, with greyish dusting, the mesonotum with four black vittæ that are distinct only in front, the surface with quite dense tomentum or pile that is closely adherent to surface, longer on pleura and posteriorly on dorsum, largely golden brown in colour. The chætotaxy as usual except that there are no presutural and only one pair of postsutural acrostichals.

Legs dark brown, the trochanters, apices of femora and the latter below to a greater or lesser extent, brownish-yellow. Fore tibia with an anterodorsal series of short bristles and one or two longer bristles on posterior side; mid tibia with the submedian ventral bristle long; hind tibia with one or two anteroventral, and two anterodorsal and posterodorsal bristles.

Wings brownish hyaline, more yellowish basally. Third vein with one or two fine hairs at base above and below; fourth vein more markedly bent forward than in *bicoloripes* Malloch, the first posterior cell ending slightly before wing tip.

Abdomen black, testaceous yellow below the lateral curve on all segments, the first two visible tergites shiny black, without noticeable dust, the next two quite densely and evenly lead-grey dusted. Hairs on the dorsally exposed portions of the first two visible tergites much denser, shorter, and more depressed than on the next two; first without apical central bristles, second with a complete apical transverse series of bristles, third and fourth with scattered discal and complete apical series of bristles.

Squamæ fulvous yellow. Halteres brownish-yellow.

Female.—Similar to the male in colour, but the yellow colour on the sides of the abdomen spreads more on to the dorsum basally.

Frons at vertex about one-fourth of the head width, the ocellar, and vertical bristles stronger than in the male, and each orbit with one or two proclinate outer bristles on upper half. The abdomen does not show as marked a distinction in the hairing of the dorsum of the first two and the next two tergites, and the bristles are very much reduced at apices of the third and fourth tergites.

Length, 9 mm.

Holotype ♂, Pahang, F.M.S.: Fraser's Hill, 4,000 feet, 30.v.1932. Allotype, Perak, F.M.S.: Larut Hills, 4,500 feet, 21.ii.1932 (H. M. Pendlebury).

Dexopollenia bicolor sp. n.

Very similar to the above species, differing most markedly in the antennæ being almost entirely black, brownish only at apex of the second segment, the legs black, and the abdomen without any yellow on the sides, the basal, or first visible tergite, dull black, with only a narrow apical fascia densely grey dusted, and all of the other three tergites entirely yellowish-grey dusted, with in some lights a few darker brownish patches or shadings. The squamæ are also much darker brown or fuscous, and the wings are not yellowish basally.

A smaller and more slender species than the one just described, with the parafacials a little broader, the gena higher, and the eye facets not noticeably enlarged above in front.

Thorax with the same bristling as the other species, with two sternopleurals as in it, and the same dense fine yellow pile, but the thorax in the type specimen is greasy so that it is impossible to determine the exact markings, if any.

I find three anterodorsal and posterodorsal bristles on the hind tibia, but in the female described above there also three bristles on these surfaces.

Abdomen with the hairs as long and as erect and not much closer on first two tergites than on the next two, the second with some distinct though not very strong discal bristles that are not as conspicuous as the discals on the third and fourth.

Length, 7 mm.

Holotype, Perak, F.M.S.: Larut Hills, 4,500 feet, 21.ii.1932 (H. M. Pendlebury).

Dexopollenia geniculata sp. n.

Female.—I briefly describe this species to establish a name for it. It is distinguished from the two just dealt with by having the basal two antennal segments and base of third fulvous yellow, the palpi except their apices of the same colour, the legs similarly coloured, with a dark stripe on each coxa, the extreme apices of all femora and bases of the tibiæ, and all of the tarsi black, the abdomen black, without pronounced dusting, the sides of first visible tergite and narrow apices of the others fulvous yellow.

The frontal orbits are wider than in the one described above, and the face has a slight but evident central carina above. Thorax with a strong pair of presutural acrostichals. Wing with the bend of fourth vein nearer to outer cross-vein and not as much rounded, the first posterior cell more drawn out.

Length, 6.5 mm.

Holotype, Mt. Omei, Szechuen Province, China (D. C. Graham). In United States National Museum.

Family TACHINIDÆ.

Genus **Palpocyptera** Townsend.

I have reviewed this genus in another paper in 1931* and in that presented a key to the then known species. Now I give below the description of a new species.

Palpocyptera atra sp. n. (Figs. 17 & 18).

Male and Female.—Shining black, the antennæ partly and palpi entirely tawny yellow, head with dense white dust, thorax also white dusted and with four inconspicuous black dorsal vittæ, second and third tergites of abdomen each with a basal fascia of white dust that is more or less broadly interrupted centrally, legs black, the tibiæ variable, sometimes much paler than the femora, wings with the apices rather broadly but indistinctly infuscated, squamæ white; halteres yellow.

Frons at vertex about one-fourth of the head width, widened in front, orbits narrow, glossy in part on upper half; interfrontalia dark brown, dull; each orbit with a reclinate bristle about midway between the anterior ocellus and the outer proclinate bristle, the lower orbital at base of antenna, inner vertical bristles long and strong, all the other bristles short and weak. Parafacial almost linear, third antennal segment in male rather noticeably widened apically, not so much so in female, its greatest width about equal to height of gena; palpi quite long.

Thorax with at least one pair of short presutural and one pair of longer postsutural acrostichal bristles; dorsocentrals 3 + 3; the suture almost midway from anterior margin to scutellum; sternopleura with two bristles, the anterior one much below the posterior one and much the weaker; scutellum with four bristles, the apical pair short and cruciate.

Legs rather stout, fore tarsi of female slightly widened apically, none of the femora with well developed ventral bristles, mid pair with one bristle on anterior side near middle, hind pair with one near base on the posterior surface; fore tibia with a submedian posterior bristle, mid tibia with a bristle on ventral, one on anterodorsal, and another on posterior surface near middle; hind tibia with two anteroventral, and one or two anterodorsal and posterodorsal bristles near middle.

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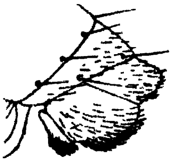
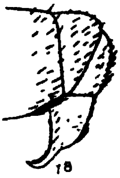
*Ann. and Mag. Nat. Hist., 7, 323.

Wings of the usual elongate type, the first posterior cell drawn out into a point and with a terminal petiole in continuation of third vein that enters costa but little before wing tip. Inner cross-vein at middle of the discal cell.

Abdomen cylindrical, slightly thickened apically, the sutures not well defined centrally, the surface of tergites with numerous deep piliferous punctures which make them appear granulose; first to third visible tergites each with a pair of apical central and one or two lateral bristles. Apex of abdomen of male as Figure 17, that of female as Figure 18.



17



18

Lower squama narrow, rounded at apex.

Length, 7–8 mm.

Holotype ♂, Perak, F.M.S.: Larut Hills, 3,700 feet, 6.ii.1932. Allotype, Pahang, F.M.S.: Fraser's Hill, 4,200 feet, 18.vi.1931. Paratype ♂, Selangor: Kuala Lumpur, near Lake Gardens, 13.x.1934. All taken by H. M. Pendlebury.

This species will run down to *pulcher*, Townsend, in my key better than to any of the others therein, but it is a much smaller species; the genotype being 13 mm. in length, with the tibiæ much paler, and the wings yellowish.

Cylindromyia hirtipleura Malloch.

I have before me a male of this species, which was originally described from a single specimen of that sex in the paper referred to above.

This specimen differs from the type in having the dark brown costal streak extending from base to apex of the first instead of the subcostal vein, but in all other characters it agrees so closely with it that I accept it as *hirtipleura*.

Selangor: Bukit Kutu, 3,300–3,500 feet, 24.ix.1932 (H. M. Pendlebury).

Genus **Billæa** Robineau-Desvoidy.

I have dealt with the status of this genus in a paper in 1929* and have little to add to what I then stated regarding it. The long haired arista and the position of the antennæ, which is below the middle of the eye in profile, appear to justify it being considered as a member of the Dexiini despite the robust stature of the flies which have the appearance of many of those referred to *Sturmia* and related genera. The eyes, prosternum, and parafacials are bare, and the centre of the propleura is haired.

I have before me a male specimen that has much the same appearance as *malayana*, Malloch, described in the paper above referred to, but it differs markedly in having the facial carina much less pronounced, almost undeveloped, and the postsutural dorsocentral bristles in four instead of three pairs, as well as in some other features.

Billæa robusta sp. n.

Male.—Black slightly shining, the interfrontalia deep black, other head parts whitish-grey dusted, apex of second and base of third antennal segment tawny yellow, palpi tawny yellow, very faintly darker basally. Thorax with four black dorsal vittæ, the submedian pair narrow and continued to behind suture, submedian pair much broader, almost complete, a narrow line between the submedian pair in front of suture and a diffuse much broader central vitta from near suture to hind margin; base of the scutellum broadly black; dust on thorax whitish-grey. Abdomen showing brownish on sides of second and third visible tergites, all the dorsal exposure of first tergite black, second and third each with a black apical fascia that expands forward on each side of central line to near anterior margin, the outline of each forward expansion rounded in front, and a black line in centre between the two forward expansions, fourth tergite with a large black apical mark. Legs black, the tibiæ slightly brownish. Wings greyish hyaline, stained with brown basally and more noticeably so on the veins. Squamæ white. Halteres yellow.

Frons at vertex less than one-fifth of the head width, widened in front, the orbits narrow, each with a series of incurved inner marginal bristles that become longer anteriorly, and laterad of these, numerous finer and shorter hairs; inner verticals strong, ocellars short but evident. Parafacial in profile about half as wide as eye and three times as wide as third antennal segment; face slightly convex in centre, but slightly visible beyond the parafacial in profile; gena half as high as eye, fine haired on the

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*Ann. and Mag. Nat. Hist., 4, 339.

raised part. Antennæ not attaining level of vibrissa, third segment about 2.5 times as long as second, the latter with a bristle that is about as long as the arista, the longest aristal hairs distinctly longer than the width of third antennal segment.

Thorax with 3 + 4 dorsocentrals and 2 + 2 acrostichals.

Legs as in *malayana*, the hind tibia with the anterodorsal series of black setulose bristles very closely placed, the fringe dense.

Wings normal, bend of fourth vein subangular, with or without a spur vein.

Abdomen stout, ovate, the central depression in first tergite attaining the apex, second without bristles on dorsum, third with a complete but widely spaced series of apical bristles, fourth with much weaker apical bristles and a number of long apical hairs; no sexual patch present.

Length, 14 mm.

Holotype, Pahang, F.M.S.: Fraser's Hill, 4,000 feet, (Pine Tree Hill), 7.iii.1933 (H. M. Pendlebury).

It may be noted that the degree of development of the facial carina has been utilized as a generic criterion by some authors dealing with the complex to which this species belongs. I have disregarded this character in my work as I find that the various species I have examined while having what I consider the essential generic characters merge gradually into each other in the facial features.

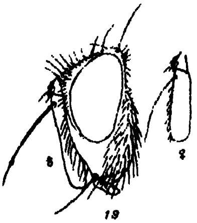
Genus **Malayia** Malloch.

1926. Phil. Journ. Sci., 31 (4), 510.

This genus was erected for the reception of a single species of which only the female was known to me. The principal character that was cited for its distinction from other nearly related genera was the presence on the outer or upper edge of the third antennal segment of a series of short setulæ or hairs. I have now before me males of the genotype and find that these setulæ are not present on the third antennal segment, though in most other characters the sexes agree. There is a difference in the length of the third antennal segment in the sexes also, that of the male extending slightly below the level of the epistome, while that of the female does not extend distinctly below midway between epistome and the lower level of the eyes. The wings do not differ in the sexes. For other characters not included in the original description of the genotype see below.

Malayia fuscinervis Malloch (Fig. 19).

1926. Op. cit., 511.



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Head of male in profile as Figure 19. Frons similar to that of the female, differing in having one or two slightly reclinate and outwardly curved upper orbitals on each side. Palpi apparently lacking in all specimens available. This last character was not clear in the original specimen. Wings with the apical half slightly blackened or browned, not always with the dark colour confined to margins of the veins as in the type specimen though in certain lights they are darker there. The abdomen of the male in subcylindrical, slightly compressed below apically, with the hypopygium small and the processes of the fifth sternite broad and rounded at the apices, without outstanding armature or structures.

Length, 4–5 mm.

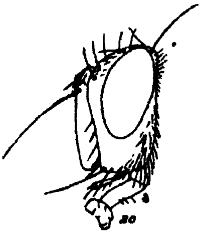
Type locality, Cameron Highlands, Pahang, F.M.S. I have two additional examples, both females from the same locality, No. 4 Camp, 4,800 feet, at light, 13.iii.1924; and a male from Pahang, Lubok Tamang, No. 3 Camp, 3,500 feet, 16.iii.1924 (H. M. Pendlebury).

Genus **Melanasomyia** gen. n.

This genus has much the appearance of *Malayia*, but the male, which is the only sex available, has the head as in Figure 20, without setulose hairs on the upper part of the parafacials, and with well developed palpi, and the abdominal tergites 3 and 4 (second and third visible tergites) each have a well developed pair of discal bristles. For other characters see specific description below.

Genotype, the following new species.

Melanasomyia flavipalpis sp. n. (Fig. 20).



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Male.—A glossy black species, with the frontal orbits glossy, interfrontalia dull, antennæ entirely black, palpi orange-yellow, mesonotum with whitish-grey dust dividing the surface into four incomplete vittæ, the abdomen with a narrow basal fascia of white dust on second and third tergites, the wings brownish hyaline, legs black, squamæ brown, and halteres brownish-yellow.

General structure of head much as in *Malayia*, but the frontal orbits each have at least one proclinate outer bristle, the interfrontalia is not as wide as either orbit instead of wider than either, the orbital hairs are much sparser and do not descend below the lower bristle, and the palpi are quite long.

Thorax much as in *Malayia*, but the apical pair of bristles on the scutellum are shorter.

Tibial bristles noticeably longer than in *Malayia.*

Wings as in that genus, the first posterior cell ending in wing tip, open, the outer cross-vein hardly half as far from inner as from bend of fourth.

Abdomen subcylindrical, compressed at apex, basal segment of hypopygium with a pair of bristles that are not present in *Malayia.*

Squamæ rather narrow, lower one rounded at apex, rather close to scutellum.

Length, 4 mm.

Holotype, Selangor: Bukit Kutu, 3,500 feet, 30.i.1930 (H. M. Pendlebury). One male.

Genus **Actia** Robineau-Desvoidy.

I have already presented a revision of the species of this genus for the Region in the Third Paper of this series.* Below I add two new species, and a new variety of a species not previously known to occur in Malaya, with additional records of a few species.

Actia magnicornis Malloch.

A male specimen before me agrees very well with the type male but the outer cross-vein of the wing is nearer apex of fifth vein than in it, with the result that the apical section of that vein is comparatively shorter than in the type. In other respects the two specimens are in agreement and I consider them conspecific.

Pahang, F.M.S.: Fraser's Hill, 4,000 feet, 25.i.1929 (H. M. Pendlebury).

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*Jour. F. M. S. Mus., 16, 1930, pp. 119–153.

Actia apicipunctata Malloch.

A male specimen that agrees in general features with the type specimen has the wing venation slightly different from that of the latter, but not more markedly so that appears to be common in other species of the genus. Too much emphasis may be laid upon the comparative lengths of the apical sections of the fourth and fifth veins and a slight shift in the position or the angle of the outer cross-vein may so materially influence these that one must be careful to consider other and more stable characters in identification of specimens.

Selangor: Bukit Kutu, 3,300 feet, 26.ix.1932 (H. M. Pendlebury).

Actia monticola Malloch.

Three specimens. Pahang, F.M.S.: Fraser's Hill, 4,000–4,200 feet, May and June 1932 (H. M. Pendlebury).

There is practically no variation in these specimens.

Actia malayana sp. n.

This species will run down to Couplet 22 in my key to the species of the genus, having the first, third, and fifth wing veins setulose above, but it has the sixth wing vein complete, which is not the case in any of the others in that group.

General colour black, with grey dust. Antennæ yellowish-brown, the third segment and aristæ fuscous; palpi orange-yellow. Frons pale brown, the face paler, the frontal orbits and face densely pale grey dusted. Frons at vertex about one-fourth of the head width, widened in front and distinctly longer than its anterior width. with the usual bristles, the anterior orbital about opposite middle of second antennal segment, with one or two minute hairs immediately below it. Parafacial linear in profile; eye twice as high as long, bare; gena hardly as high as width of the third antennal segment, the latter fully three times as long as second, not one-third as wide as eye, rounded at apex; second segment of the arista a little longer than thick, third tapered basally, with microscopic pubescence; palpi normal. One or two short bristles above vibrissa.

Thorax slightly shining, densely grey dusted, without mesonotal vittæ, the disc of the scutellum brown, its edges grey. Dorsocentrals 3 + 4, acrostichals 2 + 4, sternopleurals 3, lower stigmatal bristle long and downwardly directed.

Legs fuscous, all trochanters and fore tibiæ tawny yellow, apices of fore femora and the mid and hind tibiæ brown.

Wings greyish hyaline. First vein setulose from humeral cross-vein to apex on upper side and with a few setulæ below at apex; third vein setulose to well beyond level of outer cross-vein above and with one short bristle at base below; fifth setulose to beyond middle of discal cell above. First posterior cell narrowly open, ending close to wing tip; outer cross-vein twice as far from bend of fourth as from inner cross-vein, fourth vein rather weak beyond the preapical bend, apical section of fifth vein about two-thirds as long as its preapical one and over 1.5 times as long as preapical section of fourth, inner cross-vein a little beyond middle of the discal cell and proximad of level of apex of first vein.

Abdomen tawny yellow on basal segment and base of second, black beyond, the second to fourth tergites each narrowly whitish-grey dusted at base. Second visible tergite with a pair of apical central bristles, third with an apical transverse series of bristles.

Squamæ brown, paler on margins. Halteres yellow.

Length, 4 mm.

Holotype ♂, Selangor: Bukit Kutu, 3,500 feet, 14.ix. 1929 (H. M. Pendlebury).

It may be noted here that if one ignores the complete sixth vein as a distinguishing character in the key the species will run down to *mimetica*, Malloch, but in this species the legs are black, as is also the abdomen, and the lower stigmatal bristle is small and not downwardly directed.

Actia pendleburyi Malloch.

One female, Selangor: Bukit Kutu, 3,300 feet, 22.ix. 1932 (H. M. Pendlebury).

Actia deferens Malloch.

A male that agrees very well with the type female in colour except that the proportion of yellow is greater, differs in having the ultimate section of the fifth wing vein shorter in comparison with the penultimate section of fourth and fifth than in the female.

Selangor: Bukit Kutu, 3,300 feet, 27.ix.1932 (H. M. Pendlebury).

Actia selangor Malloch.

One male, Selangor: Bukit Kutu, 3,300 feet, 2.x.1932 (H. M. Pendlebury).

Actia eucosmæ var. nigriventris var. n.

One female that differs from the typical form in having the abdomen and legs entirely black I give the varietal name listed above. This may be a new species but it is damaged, lacking the antennæ and I prefer to consider it merely a variety.

Length, 3 mm.

Type, Selangor: Bukit Kutu, 13.iv.1926, 3,500 feet (H. M. Pendlebury).

The typical form occurs in Australia and the Philippines.

Actia fulvicauda sp. n.

Male.—A large species, of preponderantly black colour, with the basal two segments of antennæ and a portion of third segment at base and below, the entire palpi, most of the scutellum, a narrow spical line on each tergite from first to third and all of fourth tergite of abdomen, all the coxæ, and extreme apices of the femora fulvous yellow. The wings are very distinctly fulvous tinged, especially costally, and the wing veins are fulvous except apically. The thoracic dorsum is grey dusted, with four dark vittæ, and the basal three tergites of the abdomen are glossy black, with the merest trace of a slender basal fascia of white dust on the second and third.

Head about as wide as high from in front; frons at vertex slightly less than one-third of the head width, about twice as long as its width at centre, the orbits well defined, neither at middle as wide as the interfrontalia, the bristles as usual, two reclinate upper and two proclinate outer bristles well developed, ocellars of moderate length, the postverticals small and hair-like. Third antennal segment about 3.5 times as long as second, moderately wide. Parafacial linear below; gena nearly as high as width of third antennal segment and about one-ninth as high as eye; one short setula above vibrissa. Proboscis rather slender, fully as long as the antenna; palpi slender, over half as long as apical section of the proboscis.

Thorax with the bristles and hairs largely decumbent as usual in the genus, the postsutural dorsocentrals four, all three sternopleurals strong, lower stigmatal not strong nor downwardly directed.

Legs normal. All the tibial bristles very much shorter than usual, only the anterodorsal one beyond middle of mid tibia longer than the tibial diameter, hind tibia with about five short anteroventral bristles.

Wings rather wide, first posterior cell open and ending in wing tip, first vein setulose above from near base to apex and on apical third below, third setulose from base to about level of outer cross-vein above and with one setula at base below; outer cross-vein very slightly nearer to bend of fourth vein than to inner cross-vein, and slightly less than its own length from apex of fifth vein; penultimate section of fifth vein over three times as long as ultimate one.

Abdomen narrowly ovate, with quite dense decumbent short bristles, first visible tergite with no apical central bristles, the central depression extending to about middle; second tergite with a short pair of apical central bristles, third and fourth tergites each with a rather widely spaced apical series of bristles; hypopygium small, concealed.

Squamæ brownish-yellow.

Length, 6.5 mm.

Holotype, Selangor: Bukit Kutu, 3,300 feet, 28.ix.1932 (H. M. Pendlebury).

This species is the largest one known to me, and is readily distinguished from any other by the glossy black abdomen with the very narrow apical yellow apices to the basal three tergites and the entirely fulvous or orange-yellow fourth. The wings are broader than usual, and the head is rather different from that of most species, the frons being longer and narrower, and the parafacials almost obsolete below the middle in profile.

In my previously published key to the species of the genus *fulvicauda* will run down to Caption 23, second section, but it differs from *pendleburyi* in having the sixth wing vein complete, the hind tibia with but one instead of two series of short anteroventral bristles, and the abdomen differently coloured. The glossy black basal three tergites and the fulvous yellow fourth are unique in the genus as far as I am aware at this time.

Genus **Hypochæta** Brauer and Bergenstamm.

This genus has been very variously treated by different writers and there still is considerable confusion as to the status of the various names used to designate the various segregates. It does not appear necessary to go into the matter in detail and only a few notes are offered below.

The main distinguishing characters consist of the following; propleura with numerous hairs in centre; facial ridges bristled on more than the lower halves; first posterior cell of the wing open, ending rather close to wing tip; outer cross-vein nearer to inner than to bend of the fourth, the latter broadly rounded; ultimate section of fifth vein variable, usually about half as long as penultimate one; ocellar bristles erect or slightly reclinate, divergent; eyes distinctly haired; abdomen with discal and apical bristles on the intermediate tergites; female with, male without, proclinate outer orbital bristles; third antennal segment over three times as long as second.

Hypochæta orientalis Townsend.

1927. *Euhypochætopsis orientalis*, Townsend, Phil. Jour. Sci., 34 (4), 394.

I have carefully examined the type specimen of this, the genotype of *Euhypochætopsis*, and am not inclined to accord it separate generic rank. The specimen is a female and not a male as stated by Townsend, and it differs from two males now before me in lacking any minute setulæ on the apical part of the upper side of the first wing vein. It also has the tibiæ paler and the dust on the abdomen more distinct beyond the basal fascia on each tergite.

Type locality, Baguio, Benguet, Luzon, P.I. In United States National Museum.

Hypochæta atripes sp. n.

The two males now accepted as an undescribed species differ from the female above in having the legs entirely black, the abdomen with a narrow fascia of white dust on second to fourth tergites inclusive, the remainder glossy black, and a few very fine setulæ near apex of the upper side of the first wing vein.

Head black, with dense silvery white dust, the frons more yellowish dusted in certain lights; antennæ and aristæ entirely black; palpi testaceous yellow. Frons at vertex about one-fourth of the head width, widened anteriorly, with the usual bristles, which are all quite strong; the orbitals five or six in number, the orbits linear above, and with some fine hairs laterad of the bristles, the lowest one of the latter about opposite apex of second antennal segment. Parafacials bare, narrower than third antennal segment, the latter about five times as long as second; facial ridges bristled to near level of aristal insertion. Gena about one-fourth as high as eye, with one or two strong central bristles; vibrissæ long and strong.

Dorsocentral bristles 3 + 3, acrostichals 3 + 3, prealar lacking; sternopleura with two bristles; scutellum with six marginal bristles, the apical pair long and cruciate. Propleural hairs pale.

Legs black; fore tibia with a series of short anterodorsal bristles; mid tibia with a strong submedian ventral bristle.

Wings hyaline, tegula black, basal scale yellow. First vein with a few weak hairs or setulæ at apex above; third vein with two or three rather well developed bristles at base above and one or two much shorter setulæ at base below. Costa with an exceptionally developed bristle on the upper side just beyond the basal scale that is characteristic of most species of the segregate.

Abdomen cylindrical, tapered to apex, the fourth visible tergite longer than the third, first with the central depression attaining apex, without bristles, the others with discal and apical bristles. Hypopygium with the superior forceps long and slender, dull black.

Squamæ yellowish-white. Halteres yellow.

Length, 7 mm.

Holotype, Selangor: Bukit Kutu, 3,300 feet, 29.ix.1932. Paratype, topotypical, 1.x.1932 (H. M. Pendlebury).

Genus **Kinabaluia** gen. n.

This genus will run down to *Paralispe*, Brauer and Bergenstamm, in any key to the genera of Tachinidæ, having the facial ridges bristled on at least their lower halves, and the eyes hairy as well as most of the characters of that genus. In my opinion, based upon an examination of the genotype of *Paralispe*, the genus is merely an aberrant type of *Phorocera*, and doubtfully entitled to separation therefrom. The present genus differs markedly from *Phorocera* in having no bristles or setulæ on the prosternum. In the female before me the frons at vertex is not over one-sixth of the head width, widened to anterior margin, and each orbit has but one upper outwardly and slightly backwardly curved bristle above the two larger proclinate outer bristles instead of two such bristles. The eyes are distinctly haired. For other characters see description of the genotype given below.

Kinabaluia viridifulva sp. n.

Female.—Head fuscous, more reddish on the interfrontalia and above the raised part of the genæ, the other parts densely whitish-grey dusted; basal two antennal segments and the palpi fulvous yellow, third antennal segment and aristæ brownish-black. Thorax with the mesonotum metallic green, whitish dusted, more densely so on the lateral margins and with four inconspicuous dark vittæ, the scutellum bronzy, and the pleura brownish black and rather densely whitish grey dusted; all hairs and bristles black. Legs entirely fulvous yellow. Wings conspicuously suffused with fulvous yellow, most densely so basally, the veins pale at bases, slightly darker apically. Abdomen glossy, bronzy to æneous or greenish-black, with but slight greyish dusting. Squamæ and halteres fulvous yellow.

Frons at vertex not over one-sixth of the head width, widened to anterior margin, the orbits about as wide as interfrontalia as at any point, the lower orbital bristle opposite level of apex of second antennal segment, no hairs below it; ocellar bristles not longer than upper orbital, proclinate and divergent; parafacials narrowed below, at middle not over half as wide as third antennal segment, entirely bare; gena about one-fifth of the eye height, the raised part with one or two well developed bristles centrally; third antennal segment moderately wide, fully three times as long as second, the latter with a number of dorsal bristles; arista longer than the antenna, tapered basally; palpi about as long as antenna, slightly dilated apically, with numerous short black bristles; proboscis short.

Thorax with 3 + 3 dorsocentrals, 2 + 3 acrostichals, three long postsutural intra-alars, the anterior one almost in line with the anterior postsutural dorsocentral, presutural lateral area with two bristles, prealar short; sternopleurals three; propleura bare in centre; scutellum with eight marginal and four discal bristles; infrasquamal hairs present; postscutellum well developed.

Legs normal, fore tarsi not dilated; fore tibia with about seven well developed bristles on the entire extent of the anterodorsal surface and three or four on the apical two-thirds of the posterodorsal surface, the apical one of latter longer than any of the others; mid tibia with a long submedian ventral bristle and three or four on the anterodorsal and posterodorsal surfaces, the one at apex of each series the longest; hind femur with a series of strong anteroventral bristles and the basal half of the posteroventral surface with some similar bristles; hind tibia with one anteroventral bristle beyond middle, usually two posterodorsal bristles, and about eight unequal anterodorsal bristles.

Wings normal in size, costal thorn undeveloped, second costal section about two-thirds as long as first, first posterior cell open, ending a little before wing tip, third vein with some short hairs on base below and from base to short of midway to inner cross-vein above.

Abdomen ovate, the sutures distinct, first visible tergite without apical central bristles, the others with apical and discal bristles, all tergites except first with numerous bristles below near lateral edges.

Lower squama widened behind, its inner apical angle sharp, lying close to scutellum.

Length, 9 mm.

Holotype, B. N. Borneo: Mt. Kinabalu, Kamborangah, 7,000 feet, 30.iii.1929 (H. M. Pendlebury).

EXPLANATION OF TEXT FIGURES.

Fig. 1, *Atherigona ovatipennis*, wing of male.

„ 2, „ „ fore leg of male.

„ 3, „ *pendleburyi*, fore leg of male.

„ 4, *Lispocephala* (*Lispocephala*) *punctifemur*, apex of abdomen of male in profile.

„ 5, *Lispocephala* (*Lispocephala*) *pilifera*, apex of abdomen of male in profile.

„ 6, *Lispocephala* (*Lispocephala*) *nuda*, apex of abdomen of male in profile.

„ 7, *Lispocephala* (*Lispocephala*) *pilosa*, apex of abdomen of male in profile.

„ 8, *Lispocephala* (*Lispocephala*) *trochanterata*, apex of abdomen in profile.

„ 9, *Lispocephala* (*Lispocephala*) *indica*, fifth sternite of abdomen of male from below.

„ 10, *Lispocephala* (*Cephalispa*) *scutellata*, apex of abdomen of male in profile.

„ 11, *Lispocephala* (*Cephalispa*) *selangor*, (*a*), apex of abdomen in profile; (*b*), fifth sternite from below.

„ 12, *Lispocephala* (*Cephalispa*) *lata*, apex of abdomen of male in profile.

„ 13, *Lispocephala* (*Cephalispa*) *curva*, apex of abdomen of male in profile.

„ 14, *Lispocephala* (*Parvisquama*) *pahangensis*, abdomen of male in profile.

„ 15, *Lispocephala* (*Parvisquama*) *sumatrana*, apex of abdomen of male in profile.

„ 16, *Lispocephala* (*Parvisquama*) *inæqualis*, apex of abdomen of male in profile.

„ 17, *Palpocyptera atra*, apex of abdomen of male in profile.

„ 18, *Palpocyptera atra*, apex of abdomen of female in profile.

„ 19, *Malayia fuscinervis*, head of male in profile, and antenna of female.

„ 20, *Melanasomyia flavipalpis*, head of male in profile.

XLIV. NEW AND LITTLE KNOWN MALAYAN ACRIDIDÆ (Orth.).

By N. C. E. MILLER, F.R.E.S., F.Z.S.

(With one plate and eleven text figures).

The present paper is based on material collected by the writer and by Mr. H. M. Pendlebury of the Selangor Museum, Kuala Lumpur, F.M.S.

The writer is greatly indebted to Dr. B. P. Uvarov of the Imperial Institute of Entomology, London, and to Dr. C. Willemse, Eygelshoven, Holland, for examining some of the new genera and species which are described herein, and for their advice; and also to Mr. Pendlebury for permitting him to deal with specimens from the Selangor Museum.

All types will be deposited in the British Museum, (Natural History) London, and cotypes, where such exist, in the Selangor Museum.

Genus **Verdulia** Bol.

1905. Bolivar, Bol. de la Real Soc. Esp. d. Hist. Nat. p. 281.

1930. Willemse, Tijdsch. voor Entomol., LXXIII.

The following two species *Verdulia olivacea,* and *V. dohrni* are little known, therefore I have redescribed and figured them.

When I first examined them, I considered them to belong to the genus *Mitricephala* (1898. Bolivar, Ann. d. Mus. Civico d. Stor. Nat. d. Genova Ser. 2, Vol. XIX (XXXIX), p. 91), but, on a further examination they appeared to be referable to the genus *Verdulia.*

Dr. Uvarov to whom I submitted the specimens informs me that all species of *Verdulia* have been described from males, and those of *Mitricephala* from females, and that he thinks *Verdulia* (1905) is a synonym of *Mitricephala* (1898). There is no character in the generic description which would serve to differentiate between the two genera. The mistake was due to the fact that I. Bolivar referred the genus *Mitricephala* to Catantopinæ and *Verdulia* to Pyrgomorphinæ.

Verdulia dohrni Bol. (Fig. 1; Plate XIV, fig. 9).

1905. Bolivar, Bol. d. la Real Soc. Esp. d. Hist. Nat., p. 281.

1930. Willemse, Tijdsch. voor Entomol. dl. LXXIII.

Antennæ filiform, reaching just beyond basal margin of 1st abdominal segment; basal segments 3 and 4 subtriquetral. Eyes prominent, regularly ovate.

Interocular distance slightly less than greatest fastigial width; fastigium of vertex triangular with the apex rounded and the sides feebly concave; horizontal, with a longitudinal median sulcus and an arcuate transverse sulcus basally; frontal ridge in profile straight; from the front, narrow: margins subparallel, irregular; surface deeply sulcate; margins becoming obsolescent at about halfway between median ocellus and clypeus; lateral facial

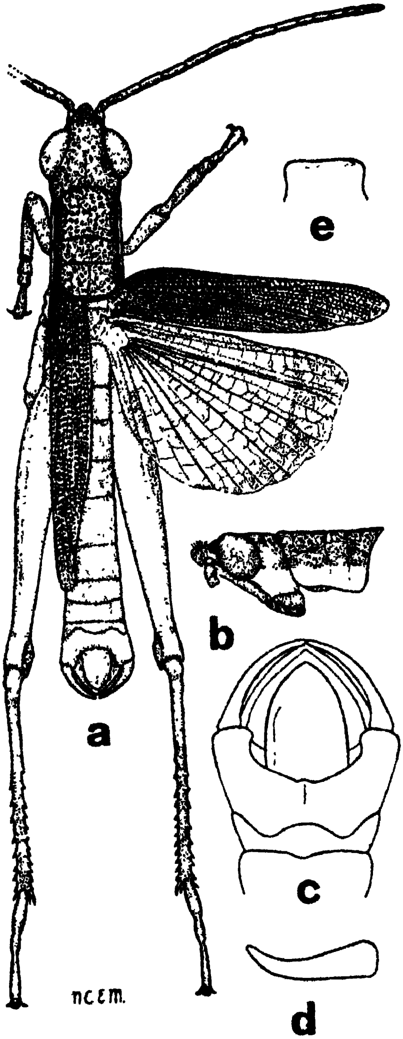

Fig. 1. *Verdulia dohrni* I. Bol.

A. Whole insect from above.
B. Head and pronotum from side.
C. Apex of abdomen from above.
D. Cercus.
E. Prosternal spine.

carinæ straight, irregularly thickened; surface of head rugose, punctate, with an almost impunctate area behind the eyes.

Pronotum selliform; anterior and posterior margins of disc broadly rounded; anterior margin with a feeble median incision: anterior margins of lateral lobes almost straight; posterior margins feebly concave; lower margins sinuate; surface rugose punctate; upper area of prozona of lateral lobes with moderately broad irregular foveolæ.

Prosternal spine transverse, broad, truncate apically, feebly constricted basally. Mesosternal lobes with the inner margins rounded. Metasternal lobes with the inner margins contiguous.

Abdomen with the apical segments somewhat broader than remaining segments; supra anal plate elongate ovate, with the apex narrowly rounded, the sides curving upwards slightly, and the surface irregularly impressed; sub genital plate broadly rounded apically, and irregularly and deeply pitted basally; ventral surface of abdomen, particularly apically with moderately long slender setæ; cerci long, curving inwards strongly, and somewhat compressed laterally apically; apex narrowly rounded.

Elytra coriaceous, narrowly rounded apically, not reaching the apex of posterior femora. Wings with the outer margin rounded, undulate.

Posterior tibiæ with twelve spines on inner margin, and eight on outer margin.

Antennæ dark purplish-brown. Eyes brown. Face brownish olivaceous; anterior margin of genæ narrowly black, lower half pale ochreous, upper half blackish; vertex brownish olivaceous.

Disc of pronotum brownish olivaceous; upper half of lateral lobes blackish, lower half pale ochreous.

Pleura blackish, with a broad horizontal pale ochreous stripe.

Sternites and abdomen brownish ochreous.

Anterior and median femora green; anterior and median tibiæ greenish with a violaceous suffusion; posterior femora green with the knees brownish; posterior tibiæ and tarsi violaceous.

Elytra olivaceous. Wings light red with the outer area moderately broadly infumate.

Total length	26.0 mm.
Pronotum	5.0 mm.
Elytra	13.0 mm.
Posterior femora ..	12.0 mm.

Described from 1 ♂, jungle beyond reservoirs, Klang Gates, Selangor, F.M.S., 17.7.32.

Verdulia olivacea Bol. (Fig. 2; Plate XIV, fig. 4).

1905. Bolivar, Bol. d. la Real Soc. Esp. d. Hist. Nat., p. 284.

1930. Willemse, Tijdsch. voor Entomol., LXXIII.

Antennæ submoniliform, with the basal segments somewhat flattened on vertral surface.

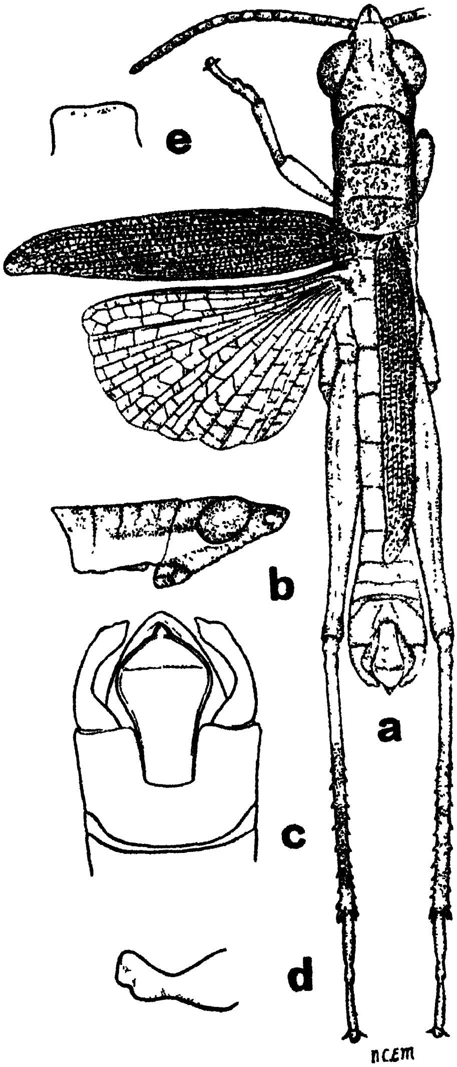

Fig. 2. *Verdulia olivacea* I. Bol.

A. Whole insect from above.
B. Head and pronotum from side.
C. Apex of abdomen from above.
D. Cercus.
E. Prosternal spine.

Eyes prominent, regularly ovate; interocular distance slightly less than greatest fastigial width; fastigium of vertex from above, triangular, with the apex rounded and the sides concave; surface with a deep median and basal sulcus; frontal ridge in profile straight; from the front, margins subparallel, irregular; sulcate throughout; margins of ridge between antennæ undulate; surface of head rugose punctate; vertex and genæ with impunctate areas.

Pronotum selliform, much longer than high; anterior margin of disc broadly rounded, with a moderately deep median incision; posterior margin broadly rounded; anterior and lower margins of lateral lobes feebly sinuate; posterior margin feebly concave; surface rugose punctate; upper area of prozona of lateral lobes with broad irregular foveolæ; third transverse sulcus crossing disc well beyond the middle. Prosternal spine transverse, rounded and with a feeble median depression apically. Inner margins of mesosternal lobes rounded; inner margins of metasternal lobes narrowly rounded, contiguous.

Abdomen somewhat broader apically than basally; supra anal plate spatulate, with the apex acute, deflected downwards feebly, the lateral margins thickened, curving upwards feebly, sinuate; apical third with a transverse carina and sulcus; surface rugulose, punctate; subgenital plate broadly conical apically, with a broad diagonal sulcus laterally; apex of abdomen setose; cerci thick, curving inwards strongly, laterally compressed apically, and with two rounded projections on lower surface near apex.

Posterior tibiæ with eight spines including an apical spine on outer margin, and twelve spines on inner margin.

Elytra coriaceous, narrowly rounded apically, almost reaching apical margin of 7th abdominal segment; apex feebly curving backwards. Wings with the outer margin broadly rounded, undulate.

Antennæ violaceous, darker apically. Eyes brown. Face pale brownish ochreous. Vertex, upper and lower areas of genæ dark olivaceous; genæ with a broad pale ochreous, sub- and post-ocular stripe, which coincides with a similar stripe along lower half of lateral lobes and along middle of pleura.

Pronotum and upper half of lateral lobes dark olivaceous.

Abdomen dark ochreous. Anterior and median tarsi dark green; anterior and median tibiæ greenish violaceous; femora green; posterior femora with reddish suffusion at knee; posterior tibiæ dark violaceous, faintly suffused with reddish basally; posterior tarsi dark violaceous.

Elytra olivaceous; wings brownish ochreous, with the outer area infumate.

Total length	29.0 mm.
Pronotum	5.5 mm.
Posterior femora ..	13.0 mm.
Elytra	14.0 mm.

Described from 1 ♂. Bukit Cherakah Forest Reserve, Kuala Selangor sub-district, F.M.S., August 1921, H. M. Pendlebury.

Genus **Kuantania** gen. n.

Size medium. Eyes moderately prominent. Antennæ moniliform, moderately thick. Head strongly punctate, rugulose; vertex with an irregular median carina; median ocellus absent.

Pronotum selliform; metazona slightly wider than prozona. Prosternal spine conical, rounded apically.

Abdomen carinate dorsally; margins of ovipositor valves smooth.

Elytra and wings rudimentary. Anterior and median legs and posterior femora moderately setose; posterior tibiæ and tarsi strongly setose; posterior tarsi more than half as long as posterior tibiæ; posterior tibiæ with eight spines on outer margin and ten spines on inner margin, and with a broad, moderately deep sulcus on outer surface basally.

Genotype the following species.—

Kuantania squamipennis sp. n. (Fig. 3: Plate XIV, fig. 6).

Antennæ subequal in length to head and pronotum together, with the six basal segments triangular in cross section; surface finely punctate. Interocular distance broader than the width of an eye.

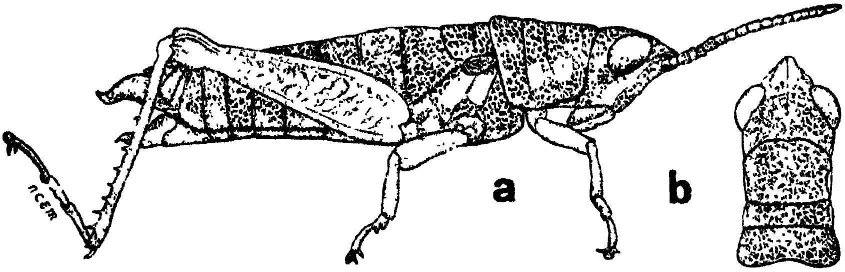

Fig. 3. *Kuantania squamipennis* gen. et sp. n.

A. Whole insect from side.
B. Head and pronotum from above.

Frontal ridge from the front deeply sulcate, narrow, obsolete near clypeus; in profile feebly concave; fastigium of vertex from above triangular, with the apex rounded, the sides sinuate and with a deep median longitudinal sulcus in apical half; vertex in profile feebly rounded.

Pronotum strongly rugose punctate; anterior margin of disc feebly sinuate; posterior margin concave; median and lateral carinæ absent; anterior and posterior margins of lateral lobes almost straight; lower margin sinuate; disc intersected by two, lateral lobes by three transverse sulci, the third being well beyond the middle.

Inner margins of mesosternal lobes rounded, the interspace about as broad as a lobe; inner margins of metasternal lobes rectangular, contiguous.

Supra anal plate short triangular; subgenital plate quadrate with a median mucronate projection on apical margin. Cerci short, triangular.

Legs robust; anterior femora and tibiæ irregularly sulcate; posterior femora somewhat compressed laterally; upper and lower carinæ feebly dentate: oblique ridges irregular.

Antennæ reddish, except segments one and two which are violaceous. Eyes dark olivaceous with irregular ochreous spots.

Head olivaceous with an ochreous stripe extending from the base of the antennæ, in front of the eyes to the angle of the clypeal suture; clypeus with a transverse ochreous spot at the base; genæ blackish olivaceous with a small postocular ochreous spot.

Disc of pronotum olivaceous; lateral lobes blackish olivaceous with an ovate ochreous spot on pro- and meta zona.

Pleura blackish olivaceous with a quadrate ochreous spot on mesopleural epimeron and on metapleural episternum; sternites greenish ochreous.

Abdomen olivaceous with some ochreous suffusion ventrally.

Elytra blackish. Anterior and median legs greenish ochreous; posterior femora dark green, paler on inner surface; knee black; posterior tibiæ violaceous, faintly brown basally; posterior tarsi violaceous with a brownish suffusion; spines on posterior tibiæ brownish with black tips.

Total length	28.5 mm.
Pronotum	5.5 mm.
Elytra	1.5 mm.
Posterior femora ..	12.5 mm.

Described from 1 ♀. Kuantan, Pahang, F.M.S., 15.6.33.

The locality in which this species was captured was "blukar" land, (*i.e.* secondary growth after jungle clearing) close to a jungle area. It is thought that the usual habitat would be the interior of the jungle.

Dr. Uvarov who examined this species states that the absence of a median ocellus and the elongated hind tarsi indicate its position near *Geloius* (Saussure H. de Wissenschaftliche Ergebnisse der Reisen in Madagascar und Ostafrika in den Jahren 1889-95 von Dr. A. Voeltzkow, Abh. Senckenb. Ges. XXIV, 1899), from which it also differs in the much shorter fastigium and in the structure of the frontal ridge.

The generic name has been associated with the type locality, Kuantan.

Genus **Pyrgophlœoba** Miller.

1929. Miller, Journ. F.M.S. Mus., XIV, p. 461.

Pyrgophlœoba nemoralis sp. n. (Fig. 4).

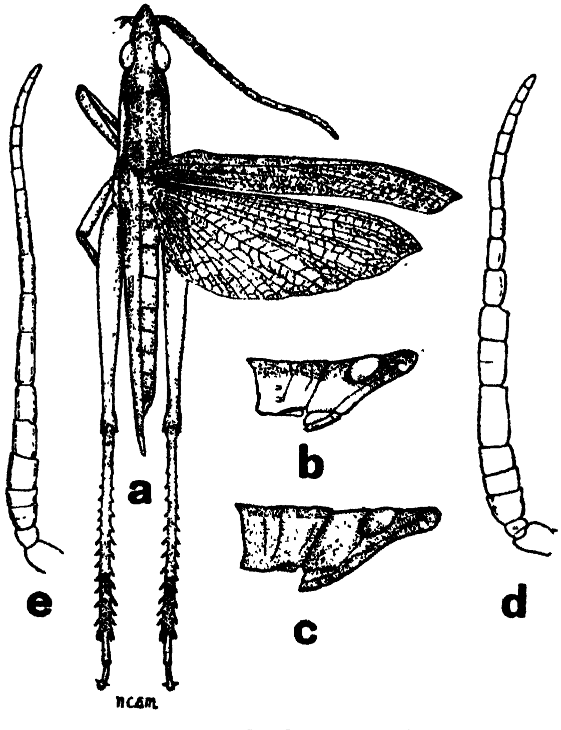

Fig. 4. *Pyrgophlœoba nemoralis* sp. n.

A. Whole insect from above.
B. Head and pronotum of from side.
C. Head and pronotum of from side.
D. Antenna ♂.
E. Antenna ♀.

Male.—Antennal segments 3–10 triangular in cross section; segments 3–6 somewhat dilated; remaining segments cylindrical; antennæ about one and a half times as long as head and pronotum together. Eyes subprominent, ovate, with the hind margin almost straight; interocular distance slightly less than the greatest width of an eye.

Fastigium of vertex from above conical; surface feebly concave: and with an arcuate carina near base; frontal ridge in profile feebly concave: from the front sulcate throughout, widened above antennæ, thence subparallel to median ocellus, thence divergent to clypeus; margins irregularly sinuate; frontal ridge, surface of face, and vertex, rugulose; genæ very feebly rugulose.

Disc of pronotum rugose with some low, rounded, tubercles in prozona; anterior margin of disc broadly rounded; posterior margin obtuse angulate; anterior margins of lateral lobes straight; posterior margins concave; lower margins obtuse angulate, with the anterior half feebly concave; median carina of disc distinct and intersected by two transverse sulci, the principal one being beyond the middle.

Supra-anal plate triangular with the apex rounded and with a broad median longitudinal sulcus; subgenital plate conical, subacute apically and feebly laterally compressed near apex; cerci simple.

Elytra with the costal lobe moderately well developed, the apex acute, and the apical margin feebly concave; wings acute apically, with the apical lobe feebly concave on outer margin.

Female.—Antennæ slightly longer than head and pronotum together; segments 6 and 8 with a feeble projection at the outer apical angle. Median carina of pronotum in profile feebly arcuate and with a feeble median depression in prozona; straight and ascending feebly in meta zona.

Male.—Lower part of face, genæ, lateral lobes and pleura brownish stramineous; upper part of face, vertex and disc of pronotum blackish-brown. Anterior and median legs light brown; posterior femora light brown, with the lower internal face blackish, and some blackish spots on lower external carina and below the knee; posterior tibiæ light brown with a faint violaceous suffusion; spines light brown tipped with black.

Elytra blackish-brown in costal and basal areas, remainder faintly infumate with irregular infumate suffusion and spots. Wings infumate.

Female.—Reddish-brown; genæ, lateral lobes, and pleura light brown.

	♂	♀
Total length	32.0 mm.	41.0 mm.
Pronotum	6.0 mm.	8.0 mm.
Elytra	23.0 mm.	29.0 mm.
Posterior femora	17.0 mm.	19.5 mm.

Described from 7 ♂s. (one of which is the type) and 3 ♀s. Bukit Kutu, Selangor, F.M.S., 26.3.32, 27.3.32, and 4.3.34, 26.3.34.

Similar to *P. pendleburyi* Miller, but differs in the shape of the antennæ, fastigium of vertex and the length of the head measured from the vertex to apex of labrum.

The frontal ridge is less strongly sulcate and its margins are less strongly thickened. It also differs in the venation of the wings.

Genus **Lucretilis** Stal.

1878. Stal, Bihang. Svensk. Akad., v. (4), pp. 41, 85.
1928. Willemse, Spolia Mentawiensia: Acrid. (Orth.).
1930. Willemse, Fauna Sumatrensis, Bijd. 62, Prelim. Rev. Acrid. (Orth.).
1934. Miller, Journ. F.M.S. Mus., Vol. XVII, p. 531.

Lucretilis uvarovi sp. n. (Fig. 5; Plate XIV, fig. 5).

Antennæ filiform, about twice as long as head and pronotum together. Eyes regularly ovate; interocular distance slightly greater than width of frontal ridge between antennæ.

Fastigium of vertex subquadrate, sloping downwards, slightly constricted basally; surface irregularly punctate: frontal ridge in profile straight, but irregular; from the front, margins feebly arcuate to median ocellus, thence obsolete; lateral facial carinæ irregular to a point level with the lower margin of the eye, thence obsolescent; surface of head rugose, punctate, with an almost impunctate area on genæ.

Anterior and posterior margins of pronotal disc broadly rounded; anterior margins of lateral lobes almost straight; posterior margins feebly concave; lower margins obtuse angulate with the angle rounded; surface of pronotum rugose; disc intersected by three transverse sulci, the first somewhat difficult to define, and the third crossing beyond the middle.

Prosternal spine transverse, truncate apically, with a short rounded prominence at each angle, and somewhat constricted basally. Pleura rugose. Elytra with the anterior and posterior margins subparallel; apex rounded. Wings with the outer margin undulate; venation somewhat thick.

Posterior femora with carinæ and oblique ridges dentate; oblique ridges regular. Posterior tibiæ with eight spines, including an apical spine on outer margin, and nine spines on inner margin.

Abdomen with groups of setæ on segments 6–8 ventrally; supra anal plate triangular, rounded apically, and with a median longitudinal sulcus in basal half; subgenital plate broadly conical; cerci simple, somewhat compressed laterally.

Segments 1–3 of antennæ dark green, remainder dark red, slightly paler in basal part. Eyes black. Head olivaceous with a blackish olivaceous postocular stripe, a pale

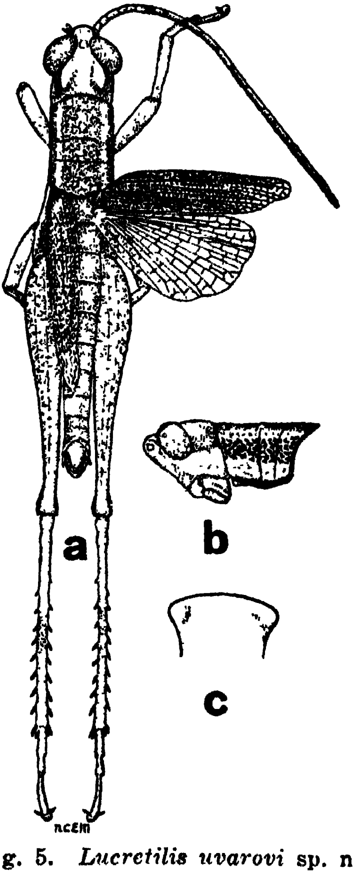

Fig. 5. *Lucretilis uvarovi* sp. n.

A. Whole insect from above.
B. Head and pronotum from side.
C. Prosternal spine.

and somewhat irregular ochreous stripe from the base of antennæ across the genæ, a pale ochreous spot on the fastigium of the vertex, and a pale ochreous spot on the vertex behind the eyes.

Disc of pronotum olivaceous with a pale ochreous stripe laterally; upper half of lateral lobes blackish green, lower half pale ochreous: pleura blackish-green with a pale ochreous stripe along lower margin. Sternites brownish ochreous.

Abdomen olivaceous with a pale ochreous stripe subdorsally; cerci and supra anal plate light brown. Elytra bluish-green, with a median longitudinal pale ochreous stripe; wings infumate with very fine black spots.

Anterior and median legs greenish ochreous; posterior femora brownish ochreous with a greenish suffusion on the upper surface of knee and on lobes; area below genicular arches brownish; posterior tibiæ dark violaceous with a greenish-yellow spot at base; posterior tarsi pale reddish-brown; setæ on legs and on abdomen ventrally whitish.

The coloration of the female is similar, with the following slight differences. Antennæ dark reddish-brown. Elytra paler. Posterior femora with the genicular lobes and top of knee black. Posterior tarsi violaceous.

	♂	♀
Total length	23.0 mm.	29.0 mm.
Pronotum	5.0 mm.	6.0 mm.
Elytra	10.5 mm.	10.0 mm.
Posterior femora	14.0 mm.	15.5 mm.

Described from 1 ♂, 6.6.1933 (type), 1 ♂, 15.6.1933, Kuantan, Pahang, F.M.S. and 1 ♀, Serdang, Selangor, F.M.S., 8.7.1934.

In one of the males captured at Kuantan there was a *Mermis* worm measuring 127 mm. in length. This was immature.

Genus **Paracelebesia** gen. n.

Size moderate. Fastigium projecting beyond the eyes; from above, oblong with the lateral margins feebly concave.

Pronotum somewhat narrower in front than behind; the third transverse sulcus crossing the disc beyond the middle; median carina absent.

Prosternal spine conical, somewhat slender, mucronate apically.

Mesosternal lobes slightly broader than long, their inner margins rounded; inner margins of metasternal lobes narrowly rounded and separated by a moderately broad interspace.

Carinæ on posterior femora dentate; posterior tibiæ curving inwards feebly, with acute margins in apical half, and with seven spines on external, and eight spines on internal margin.

Supra anal plate triangular, with the apex rounded, a broad deep median sulcus in basal half, and with the apical half dorso-ventrally compressed. Cerci simple. Sub genital plate with the apical margin acute angulate.

Genotype the following species:—

Paracelebesia festiva sp. n. (Fig. 6; Plate XIV, fig. 7).

Antennæ filiform, moderately thick; basal segment cylindrical, slightly constricted near apex, and considerably thicker than remaining segments.

Eyes prominent, ovate, with the front margin almost straight, interocular distance subequal to width of frontal ridge between antennæ; frontal ridge in profile, bisinuate; from the front, margins sinuate and thickened to median ocellus, thence obsolescent; vertex rugose with an indication of a median carina; surface of face and lower half of genæ rugose; upper half of genæ feebly punctate.

Anterior margin of pronotal disc convex with a median incision; posterior margin broadly rounded; anterior margins of lateral lobes rounded; posterior margins concave; anterior half of lower margin concave, posterior half straight; surface rugose punctate.

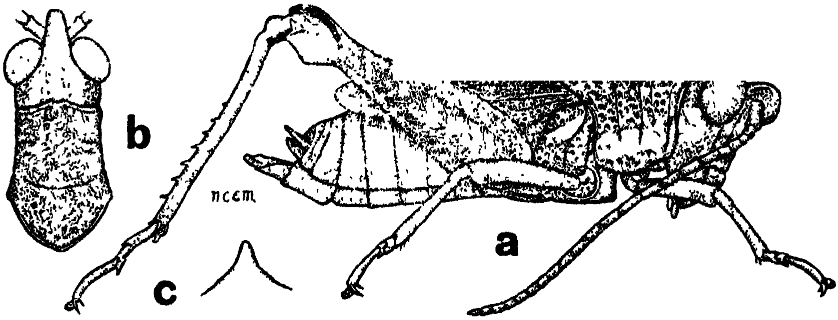

Fig. 6. *Paracelebesia festiva* gen. et sp. n.

A. Whole insect from side.
B. Head and pronotum from above.
C. Prosternal spine.

Oblique ridges on posterior femora sinuate and somewhat irregular in basal half.

Elytra elongate ovate with the costal lobe well developed.

Antennæ dark reddish-brown. Eyes brown. Face brownish ochreous; frontal ridge dark olivaceous; genæ olivaceous with postocular ochreous stripe; vertex brownish ochreous with an olivaceous area basally.

Disc of pronotum greenish ochreous, darker in meta zona; lateral lobes dark green with a submedian transverse ochreous stripe.

Pleura dark olivaceous, with an ochreous spot on upper area of metasternal episternum. Sternites brownish ochreous.

Abdomen greenish ochreous with olivaceous suffusion.

Tarsi brownish olivaceous; femora and tibiæ green; genicular lobes and upper surface of knee of posterior femora ochreous; genicular arches dark brown; posterior tibiæ with blackish suffusion apically on internal surface, and the base brownish ochreous; spines black.

Elytra green; wings hyaline, faintly green along costal area and infumate in outer area.

Total length	26.0 mm.
Pronotum	6.75 mm.
Elytra	13.0 mm.
Posterior femora ..	14.0 mm.

Described from 1 ♀, Sungei Lui, Ulu Langat sub district, Selangor, F.M.S., 28.8.32. In jungle.

This genus is near *Celebesia* C. Bol. (Revista Real Acad. Cienc. Ex. Fis. y Nat. de Madrid, XV, num. 10, p. 640), but differs by having the posterior tibiæ with acute margins and by the absence of a median pronotal carina.

Genus **Traulidea** Will.

1930. Willemse, Fauna Sumatrensis, Bijd. Nr. 62, Prelim. Rev. Acrid. (Orth.).

1934. Miller, Journ. F.M.S. Mus., Vol. XVII, p. 204.

Traulidea cauta sp. n. (Fig. 7; Plate XIV, fig. 3).

Antennæ filiform, reaching to about half the length of posterior femora; eyes subprominent, broadly ovate, with the front margin almost straight; interocular distance slightly less than width of frontal ridge between antennæ.

Fastigium of vertex truncate apically and with the sides feebly concave; frontal ridge in profile, sinuate; from the front, margins parallel to median ocellus, thence obsolete; surface of head smooth with some scattered punctures on face, lower half of genæ and vertex.

Pronotum selliform, slightly narrower in front than behind; anterior and posterior margins of disc broadly rounded; anterior and posterior margins of lateral lobes almost straight; lower margin rotundate-angulate, with the anterior half concave; disc intersected by three transverse sulci, the third being beyond the middle; surface of pronotum rugose punctate. Prosternal spine, short, conical, mucronate. Inner margins of mesosternal lobes rectangular; of metasternal lobes rounded, subcontiguous.

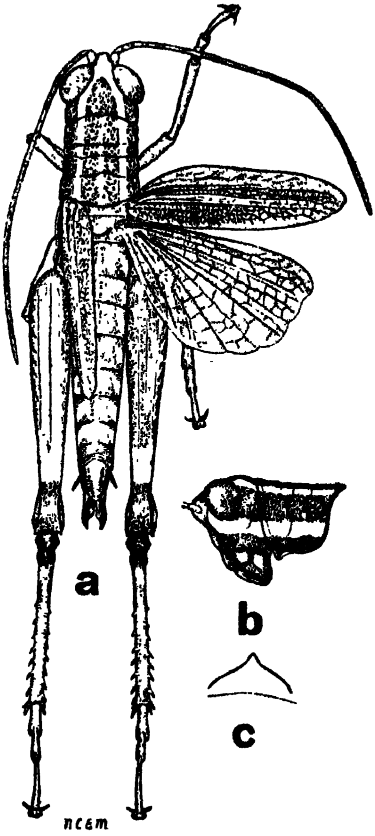

Fig. 7. *Traulidea acuta* sp. n.

A. Whole insect from above.
B. Head and pronotum from side.
C. Prosternal spine.

Supra-anal plate triangular, with the apex rounded, and the sides deflected; apical margin of subgenital plate acute angulate.

Posterior femora robust; oblique ridges regular; carinæ on upper surface feebly dentate. Posterior tibiæ with seven spines on outer margin, and eight spines on inner margin including an apical spine.

Elytra elongate elliptical, with a feeble incision on inner margin near apex; wings with the outer margin undulate.

Antennæ with the two basal segments green, three apical segments greenish-white, remainder dark brown.

Eyes dark brown. Head black with a broad orange stripe from the apex of vertex, along the inner margins of the eyes then bifurcating to base of head; vertex between the eyes greenish; face, clypeus and mandibles with ochreous spots; side of head with a broad ochreous stripe from the base of antennæ along the lower margin of the eyes to posterior margin of genæ.

Pronotum black, with the median carina of disc ochreous, a broad orange stripe along lateral carinæ, and an ochreous stripe across the lateral lobes. Pleura black, with a median transverse broad ochreous stripe. Sternites and abdomen dark green with ochreous spots. Abdomen with a narrow longitudinal ochreous stripe middorsally; ovipositor valves black with the sides ochreous; supra-anal plate with an ochreous spot in basal half. Anterior and median legs green; posterior femora dark green with the knees black, and a pregenicular ochreous stripe; posterior tibiæ dark olivaceous, black basally, and with a faint ochreous suffused spot near base; spines on tibiæ brownish black; posterior tarsi dark green.

Elytra olivaceous, with a median longitudinal ochreous area; venation brownish olivaceous. Wings infumate.

Total length	21.0 mm.
Pronotum	4.0 mm.
Elytra	10.0 mm.
Posterior femora ..	11.0 mm.

Described from 1 ♀, in jungle, beyond Reservoirs, Klang Gates, Selangor, F.M.S. 1.10.33.

Traulidea picturata sp. n. (Fig. 8; Plate XIV, fig. 2).

Antennæ filiform, reaching almost to base of knee of posterior femora.

Eyes prominent, subspherical; interocular distance slightly less than width of frontal ridge between antennæ;

fastigium of vertex pentagonal, truncate apically; frontal ridge in profile feebly concave; from the front, margins parallel to median ocellus, thence obsolescent; surface irregularly punctate; face and lower half of genæ rugose; rest of head with scattered deep punctures; vertex with a rugulose area.

Pronotum selliform, slightly narrower in front than behind; anterior margin of disc broadly rounded, with a feeble median incision; posterior margin broadly rounded; anterior margins of lateral lobes broadly rounded; posterior margins almost straight or feebly concave; lower margin obtuse angulate with the angle rounded and the anterior half concave: surface of pronotum strongly rugose; surface of disc deeply cut by three transverse sulci, the third beyond the middle; margins of pronotum thickened. Prosternal spine short, conical, mucronate apically. Mesosternal lobes with the inner margins rounded, the interspace broad, widening posteriorly. Metasternal lobes sub contiguous. Pleura rugose.

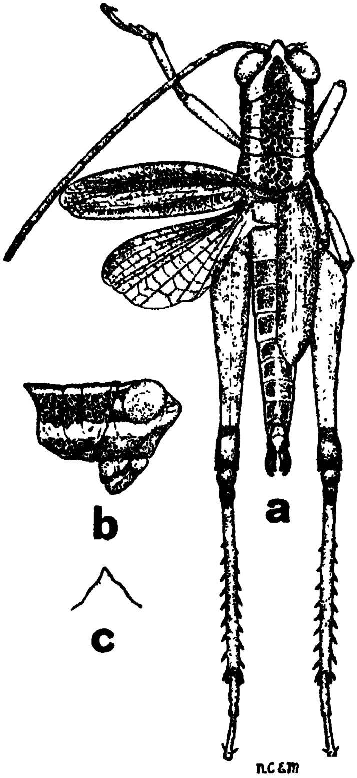

Fig. 8. *Traulidea picturata* sp. n.
A. Whole insect from above.
B. Head and pronotum from side.
C. Prosternal spine.

Supra-anal plate triangular, rounded apically, laterally compressed, and with a broad depression in the basal half; surface with scattered punctures. Subgenital plate with the apical margin acute angulate.

Elytra elliptical, reaching just beyond the middle of posterior femora. Wings with the outer margin undulate.

Posterior femora with the upper carina broadly serrate; upper outer and inner and lower outer surface rugose: oblique ridges regular, posterior tibiæ with eight spines on external margin, and nine spines including an apical spine on internal margin.

Antennæ dark reddish-brown. Eyes dark brown. Head black with ochreous spots on face, clypeus and mandibles, an ochreous stripe from the base of antennæ along the lower margin of the eyes and across the middle of the genæ: fastigium of vertex ochreous, margins black; vertex with two broad ochreous stripes.

Pronotum black with an ochreous stripe laterally on disc, and a broad transverse ochreous stripe on lower half of lateral lobes. Pleura black with a median transverse ochreous stripe. Sternites brownish ochreous with ochreous spots.

Abdomen black with a longitudinal ochreous stripe dorsally and below the spiracular area, and a diagonal ochreous spot on each segment laterally; ovipositor valves and cerci black.

Elytra brownish olivaceous with a median pale ochreous stripe from base to apex; wings infumate.

Anterior and median legs reddish-brown; posterior femora reddish-brown with a pregenicular ochreous ring; knees dark reddish-brown; posterior tibiæ olivaceous, knee dark brown and with a pale ochreous ring below the knee; posterior tarsi brownish olivaceous.

Total length	23.0 mm.
Pronotum	5.0 mm.
Elytra	10.0 mm.
Posterior femora ..	13.0 mm.

Described from 1 ♀, Sungei Lui, Ulu Langat sub-dist. Selangor, F.M.S. (in jungle). 18.9.32.

Traulidea intermedia sp. n. (Fig. 9; Plate XIV, fig. 1).

Antennæ filiform, reaching beyond the middle of posterior femora; basal segment thick, cylindrical. Eyes moderately prominent, ovate, with the front margin almost straight; interocular distance slightly less than width of frontal ridge between antennæ; frontal ridge in profile feebly concave; from the front, margins parallel between antennæ, thence converging to median ocellus, thence obsolete; fastigium of vertex from above truncate apically, with the sides feebly concave; surface of head rugulose punctate.

Anterior and posterior margins of disc of pronotum broadly rounded; anterior margin almost straight medially; anterior and posterior margins of lateral lobes almost straight; lower margins obtuse angulate with the anterior half feebly concave; surface of pronotum and pleura rugose punctate. Prosternal spine short, conical, mucronate apically.

Inner margins of mesosternal lobes broadly rounded, and separated from each other by the width of a lobe; inner margins of metasternal lobes moderately narrowly rounded, separated by a narrow triangular area and two deep depressions.

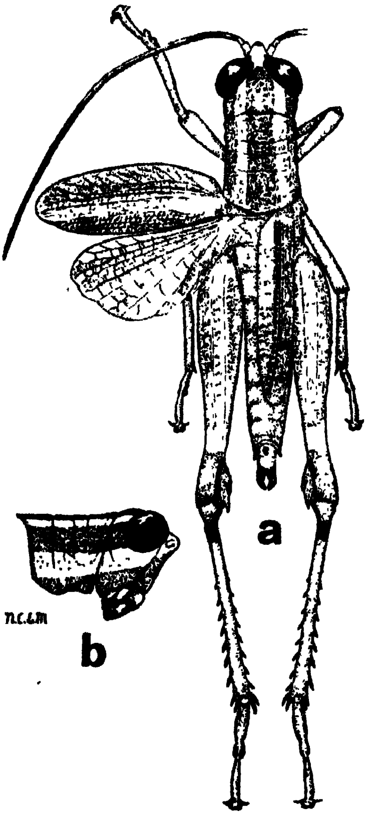

Fig. 9. *Traulidea intermedia* sp. n.

A. Whole insect from above.

B. Head and pronotum from side.

Supra anal plate triangular, with the sides deflected, and a moderately deep median sulcus in basal third. Subgenital plate with the apical margin acute angulate, the angle rounded, and with the surface flattened and punctate except in basal fourth.

Elytra elliptical; venation in costal area sparse and indistinct; reaching to apical margin of 7th abdominal segment; wings with sparse venation in costal area; outer margin undulate.

Posterior femora robust, with the upper carina sparsely dentate; posterior tibiæ with eight spines on outer margin, and nine spines, including an apical spine, on inner margin.

Two basal segments of antennæ pale green, segments 4–10 reddish, remainder reddish-brown. Eyes black. Head black, with a whitish ochreous spot on fastigium of vertex, moderately broad stripes of the same colour along inner margins of the eyes to base of head, from base of antennæ along lower margins of eyes, and across genæ, a spot of the same colour near clypeal suture and two spot on clypeus; mandibles and labrum with greenish-yellow spots.

Pronotum black, with a moderately broad pinkish ochreous stripe along lateral carinæ of disc and on lower half of lateral lobes; pleura black, with a greenish-yellow spot near lower margin of meso pleural episternum, and a median transverse whitish or pinkish ochreous stripe.

Sternites green with yellowish suffusion.

Abdomen, green with a suffused yellow stripe dorsally and laterally.

Legs green; posterior femora with knees reddish and a pregenicular pale ochreous stripe; posterior tibiæ reddish basally.

Elytra black with a median longitudinal ochreous stripe; wings infumate.

Total length	21.5 mm.
Pronotum	5.0 mm.
Elytra	10.0 mm.
Posterior femora ..	12.5 mm.

Described from 1 ♀, in jungle beyond Reservoirs, Klang Gates, F.M.S. 25.2.34.

Apart from coloration, this species differs from *T. picturata* in the venation of the wings, the more strongly rugose pronotum, the prosternal spine less acute apically, the lateral facial stripe and stripe on lateral margin of disc of pronotum broader, and the anterior and posterior margins of the elytra more rounded.

Genus **Gerenia** Stal.

1878. Stal, Bih. Svensk. Akad. Handl., v. (4), pp. 28, 73.
1914. Kirby, Fauna Brit. India, Orth. Acrid., p. 243.

Gerenia selangorensis sp. n. (Fig. 10; Plate XIV, fig. 8).

Eyes ovate, prominent; interocular distance slightly less than width of frontal ridge between antennæ; fastigium of vertex from above rounded, with the sides feebly concave; margins of frontal ridge from the front parallel to median ocellus, then constricted, thence parallel and subsinuate to clypeus; margins thickened and surface sulcate; in profile feebly concave; lateral facial carinæ almost straight; anterior of genæ with a pronounced carina; surface of face and genæ rugose, of vertex almost smooth.

Anterior margin of pronotal disc obtuse angulate: posterior margin acute angulate, with the sides feebly concave: anterior and posterior margins of lateral lobes straight; lower margin obtuse angulate with the anterior half feebly concave; in profile, median carina quadrilobate, the anterior lobe nearly half as long as posterior lobe, median lobes subequal in length; surface of pronotum and pleura rugose. Prosternal spine conical, mucronate.

Inner margins of mesosternal lobes almost straight, separated by almost the width of a lobe; inner margins of meta sternal lobes forming an obtuse angle with the immediate angle rounded, separated by a third of the width of a lobe.

Supra anal plate triangular with the apex rounded and with a moderately deep sulcus in apical and basal halves; subgenital plate conical, laterally compressed and with a rounded depression basally. Cerci simple. Elytra subcoriaceous, with the costal lobe well developed and the apex rounded.

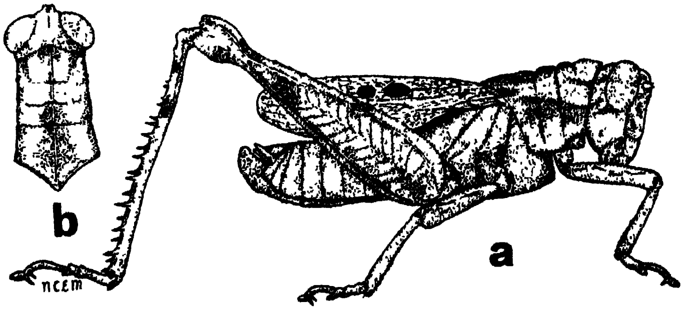

Fig. 10. *Gerenia selangorensis* sp. n.

A. Whole insect from side.
B. Head and pronotum from above.

Anterior and median femora with a longitudinal carina on upper surface; oblique ridges on posterior femora regular and irregularly thickened; upper carinæ serrate, the uppermost terminating in a short spine; posterior tibiæ with nine spines on outer, and ten spines including an apical spine on inner margin.

Antennæ missing. Eyes light brown. Head, pronotum and pleura olivaceous with irregular dark brown spots and suffusion. Elytra brown with two large black spots in *area discoidalis*. Wings infumate. Anterior and median tibiæ reddish with pale ochreous spots. Tarsi reddish. Anterior and median femora olivaceous with dark brown suffusion: posterior femora with irregular brownish suffusion basally a median and submedian somewhat indefinite transverse brownish stripe, a brownish pregenicular suffusion, the lower outer face black and the lower inner face dark red; knee light brown; genicular arch dark brown; posterior tibiæ reddish with some brownish suffusion in basal half; spines with dark brown tips.

Total length	21.0 mm.
Pronotum	7.0 mm.
Elytra	12.0 mm.
Posterior femora ..	15.0 mm.

Described from 1 ♂, Ginting Bidai (no date). Selangor Museum.

Genus **Tekua** gen. n.

Size moderate. Lateral lobes of pronotum with a deep and broad depression basally in posterior half: disc with three transverse sulci, the third being beyond the middle. Prosternal spine transverse, truncate apically with the angles rounded; slightly constricted basally.

Inner margins of mesosternal lobes rounded, separated by the width of a lobe; inner margins of metasternal lobes rounded, subcontiguous.

Abdomen with two parallel rows of erect and moderately long setæ on segment seven basally; supra anal plate triangular with the apex rounded, the sides feebly laterally compressed and with a broad median longitudinal sulcus; subgenital plate quadrate, with the apical margin rounded and with a median mucronate projection; cerci simple; upper margins of upper and lower margins of lower ovipositor valves serrate.

Elytra reaching about to middle of 3rd abdominal segment.

Upper carina of posterior femora with some feeble serrations in basal half; posterior tibiæ with six spines on outer, and seven spines including an apical spine on inner margin.

Genotype, the following species:—

Tekua unicolor sp. n. (Fig. 11; Plate XIV, fig. 10).

Eyes subprominent, irregularly ovate; interocular distance as broad as depression on fastigium of vertex; fastigium of vertex from above rounded and with a deep median depression; frontal ridge in profile straight; from the front, margins subparallel to just below median ocellus, thence obsolete; lateral facial carinæ obtuse angulate; surface of face and lower area of genæ rugulose; upper area of genæ and vertex smooth; vertex with some punctures basally laterally.

Anterior margin of pronotal disc rounded, with a median concavity; posterior margin rotundate-angulate; anterior and posterior margins of lateral lobes straight; lower margin obtuse angulate with the anterior half strongly concave; anterior area of disc and lateral lobes with a moderately broad sulcus; surface of pronotum rugose. Abdomen carinate and rugulose dorsally. Elytra coriaceous, subelliptical.

Oblique ridges on posterior femora regular. Legs and ventral surface of abdomen moderately setose; posterior femora with fewer setæ.

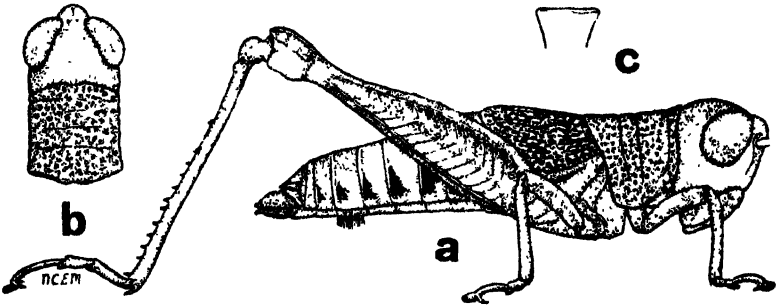

Fig. 11. *Tekua unicolor* gen. et sp. n.
A. Whole insect from side.
B. Head and pronotum from above.
C. Prosternal spine.

Antennæ missing. Eyes reddish-brown. General coloration brownish ochreous. Head with a very narrow blackish area around eyes. Legs brownish-orange except posterior tibiæ; anterior and median legs with an olivaceous suffusion; posterior femora with the outer face almost

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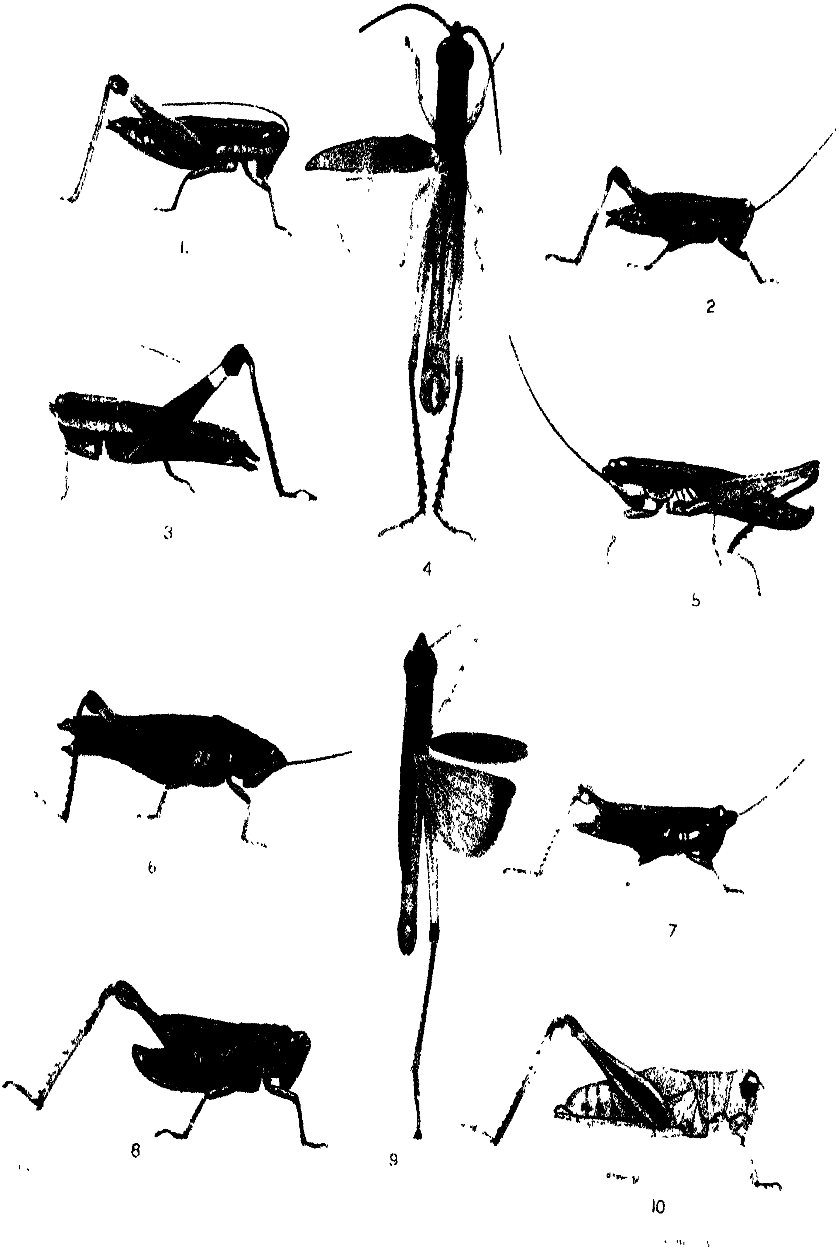
Plate XIV.



NEW & LITTLE KNOWN MALAYAN ACRIDIDAE (ORTH).

entirely, the lower faces entirely blackish-green; upper face with two indistinct blackish-green transverse fasciæ, the apical one extending along inner face; knees reddish-brown; posterior tibiæ green, reddish-brown basally; spines black. Abdomen with irregular blackish areas laterally. Elytra brownish ochreous. Wings dark brown.

Total length	26.0 mm.
Pronotum	4.0 mm.
Elytra	7.0 mm.
Posterior femora ..	15.0 mm.

Described from 1 ♀; Pahang: Kuala Teku, 500 feet, August-November 1920 (Selangor Museum). The generic name has been associated with the type locality.

EXPLANATION OF PLATE XIV.

Fig. 1. **Traulidea intermedia** sp. n. (page 703).
„ 2. **Traulidea picturata** sp. n. (page 701).
„ 3. **Traulidea cauta** sp. n. (page 699).
„ 4. **Verdulia olivacea** Bol. (page 689).
„ 5. **Lucretilis uvarovi** sp. n. (page 695).
„ 6. **Kuantania squamipennis** gen. et sp. n. (page 691).
„ 7. **Paracelebesia festiva** gen. et sp. n. (page 698).
„ 8. **Gerenia selangorensis** sp. n. (page 706).
„ 9. **Verdulia dohrni** Bol. (page 686).
„ 10. **Tekua unicolor** gen. et sp. n. (page 708).

XLV. A NEW SPECIES OF BORNEAN ACRIDIDÆ (ORTH.).

By N. C. E. MILLER, F.R.E.S., F.Z.S.

(With one text figure).

In Part 1 of this *Journal* (antea, pp. 203–208, 1932), I described some new species of Acrididæ from Mt. Kinabalu, British North Borneo. Since that time another new species belonging to the genus *Paracelebesia* (antea, p. 697) has come to hand, and I am indebted to Mr. H. M. Pendlebury for the privilege of describing this species.

Paracelebesia cinctifemur sp. n. (Fig. 1).

Antennæ (damaged in type specimen) filiform, rather thick, segment 1 cylindrical, somewhat thickened apically, and about as long as segments 2–4; segment 1 smooth, remainder punctate.

Eyes moderately prominent, broadly oval with the front margin almost straight; interocular distance subequal to width of frontal ridge between antennæ.

Fastigium of vertex sloping downwards very slightly, projecting considerably beyond the eyes; from above, triangular, with the apex rounded and the sides feebly concave: in profile broadly rounded; frontal ridge in profile broadly rounded between antennæ then obsolete; from the front, margins subparallel to a point level with lower margin of 1st antennal segment, then feebly laterally compressed; surface smooth with some punctures between antennæ, then sulcate; surface of face rugose, of vertex, genæ, and a narrow area in front of the eyes, smooth; vertex with some punctures; lateral facial carinæ indistinct, arcuate in front of the eyes, thence obsolete.

Pronotum somewhat constricted laterally in apical half; surface rugose; anterior margin of disc feebly convex or

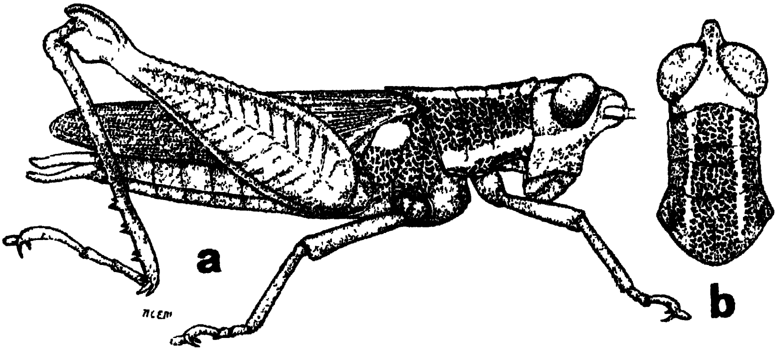


Fig. 1. *Paracelebesia cinctifemur* sp. n.
A. Whole insect from side.
B. Head and pronotum from above.

sinuate, with a median incision; posterior margin rotundate-angulate; anterior margins of lateral lobes feebly sinuate; posterior margins straight; lower margins concave in anterior half, almost straight in posterior half; disc intersected by three transverse sulci, the second being before, the third beyond, the middle. Prosternal spine conical, mucronate.

Inner margins of mesosternal lobes rounded; mesosternal interspace quadrate, wider than a lobe. Metasternal lobes with the inner margins widely separated, rotundate-angulate.

Supra anal plate triangular with the apex rounded, and with a median transverse sulcus.

Subgenital plate quadrate, laterally constricted, with a carina on each side converging towards the base, and with a long median mucronate process apically.

Upper and lower ovipositor valves slender, smooth and feebly curved.

Upper inner and outer, and lower inner carinæ on posterior femora serrate; oblique ridges regular; genicular lobes angulate, mucronate apically.

Posterior tibiæ with eight spines on inner and outer margins. Posterior tarsi longer than half a tibia.

Elytra subcoriaceous with the costal lobe moderately well developed, the apex rounded, and with a feeble incision on inner margin near apex; reaching beyond the apex of body but not to apex of ovipositor valves.

General coloration greenish-olivaceous; antennæ, except basal segment, dark reddish-brown; basal segment brownish-olivaceous. Eyes brown. Vertex brownish. Head with an ochreous stripe in front and behind the eyes on the vertex. Pronotum with a narrow ochreous stripe on disc, becoming obsolete in metazona, and near the lower margins of lateral lobes; metasternal episternum with an ovate ochreous spot.

Posterior femora with the knees brownish and with a pregenicular ochreous ring; posterior tibiæ brownish olivaceous with an indistinct ochreous spot near knee; spines black; anterior and median legs and elytra olivaceous; wings infumate.

Total length	23.5 mm.
Pronotum	11.0 mm.
Elytra	13.0 mm.
Posterior femora ..	12.5 mm.

Described from 1 ♀. Kabayau, nr. Mt. Kinabalu, British North Borneo, 600 ft., 8.4.1929. H. M. Pendlebury.

XLVI. NEW AND LITTLE-KNOWN MALAYSIAN *LYMANTRIIDÆ (LEPIDOPTERA HETEROCERA).*

By C. L. COLLENETTE, F.R.E.S.

(With four figures).

The *Lymantriidæ* described in this paper were included in a collection kindly sent to me from the Selangor Museum, Kuala Lumpur. Types have been presented to the British Museum (Nat. Hist.).

In my paper on the *Lymantriidæ* of the Malay Peninsula (Nov. Zool. XXXVIII, pp. 49–102, 1932) the number of species enumerated was 91. Two further species,—*Scarpona trasiana* Collnt. and *Dasychira venusta* Collnt.—were described in Stylops, II, p. 43, 1933. In the present paper three new species and one new to the Peninsula are added, while one (*Leucoma flora* Swinh.) has been deducted, giving a total for Malaya of 96 species.

Ridgway's *Color Standards and Color Nomenclature* (1912) has been employed in the colour descriptions.

Leucoma florella sp. n. (Fig. 1).

♂. Palpus ochraceous tawny, darker at the tip. Head and antennal shaft verona brown, the pectinations lighter. Thorax and abdomen pale pinkish buff spotted with verona brown. Pectus, venter and legs pale pinkish buff to light buff, the fore-leg tinged with ochraceous tawny. Fore-wing verona brown, with a broad broken band of pale pinkish buff running from base to apex parallel with the costa, and with extensions from the band to inner margin basally and medially; a few scattered spots of pale pinkish buff faintly visible towards the tornus; fringe verona brown. Hind-wing pale pinkish buff, broadly shaded along the termen, and also above the 2nd anal vein to the base of the wing, with verona brown; fringe verona brown. Underside of fore-wing pale pinkish buff, costal and terminal areas verona brown; a streak of pale pinkish buff in the apex between veins *R*4 and *M*1; fringe verona brown. Underside of hind-wing pale pinkish buff; terminal area and fringe verona brown.

Expanse: ♂♂ 24–27 mm.

1 ♂ (holotype) and 3 ♂♂ (paratypes), at light, January, August and October (2), Kuala Lumpur, Selangor; also 1 ♂, at light, 2,000 ft., March 1922, Nakon Sri Tamarat, Khao Luang, Peninsular Siam; all taken by H. M. Pendlebury.

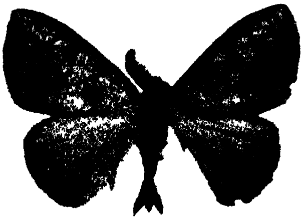


Fig. 1. *Leucoma florella* sp. n. ♂.

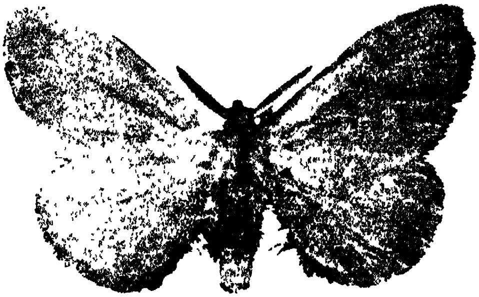


Fig. 2. *Euproctis melanodema* sp. n. ♂.

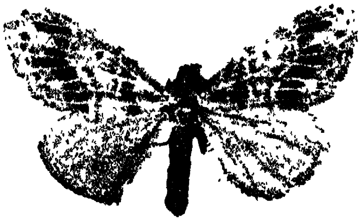


Fig. 3. *Euproctis megerata* sp. n. ♀.

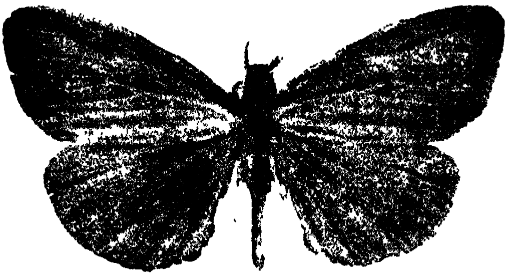


Fig. 4. *Pantana macrotera* sp. n. ♂.

Resembles *Leucoma flora* Swinh. but smaller and much more heavily marked, and without the spot on the discocellulars of the fore-wing.

In my "*Lymantriidæ* of the Malay Peninsula", p. 56, I included *Leucoma flora* Swinh. on the strength of a single very rubbed specimen from Singapore. This specimen should be placed under *Leucoma florella* Collnt. and *L. flora* removed from the Malayan list.

Euproctis melanodema sp. n. (Fig. 2).

♂. Palpus tawny olive. Antennal shaft whitish, pectinations cinnamon buff. Head and thorax ochraceous buff. Abdomen, Prout's brown, basal segments and anal tuft ochraceous buff. Pectus, venter and legs pale pinkish buff. Fore-wing maize yellow; a patch of dark irroration faintly visible medially between the cell and the inner margin; traces of a light subterminal fascia parallel with the termen; fringe maize yellow. Hind-wing and fringe pale pinkish buff; inner marginal area faintly tinged with drab Underside of both wings, and fringes, pale pinkish buff.

♀. The dark irroration on the fore-wing is extended faintly over the whole wing area. The hind-wing above entirely drab, fringe pale pinkish buff. Underside of both wings drab, fringes pale pinkish buff.

Expanse: ♂♂ 35–39 mm., ♀♀ 52–54 mm.

1 ♂ (holotype), 1 ♀ (allotype), 3 ♂♂ and 1 ♀ (paratypes), Bukit Kutu, Selangor, at light, 3,300 ft., September 1932, H. M. Pendlebury.

I have placed the two sexes under the same name with some hesitation, as the ♂ has a light, and the ♀ a dark, hind-wing. Their agreement in several other details, however, and the fact that they were taken in the same month and locality, appear to justify the course taken.

The species is nearly allied to *Euproctis innotata* Wlkr.

Euproctis megerata sp. n. (Fig. 3).

♀. Palpus light buff, spotted on the outer side with mummy brown. Antennal shaft light buff, the pectinations somewhat darker. Head and thorax light buff to warm buff, spotted on the thorax with mummy brown. Abdomen warm buff mixed with mummy brown, anal tuft mummy brown. Pectus, venter and legs light buff to warm buff, fore and middle legs irrorated sparsely with mummy brown.

Fore-wing warm buff, lighter between the veins; the following mummy brown markings: two small patches subbasally above and below the cell; a double antemedial fascia, broken at the veins, the proximal portion broad, the distal portion narrow; a spot on the discocellulars; double postmedial fascia, broken at the veins, the proximal portion narrow, the distal portion broad; a series of subterminal interneural spots; fringe light buff mixed with warm buff, tipped interneurally with mummy brown. Hind-wing warm buff, the fringe somewhat lighter. Underside of both wings light buff to warm buff, with slight mummy brown irroration medially; fringes light buff, tipped interneurally on the fore-wing with mummy brown.

Expanse: ♀ ♀ 24–25 mm.

1 ♀ (holotype) and 1 ♀ (paratype) Bukit Kutu, Selangor, at light, 3,300 ft., September 1932; 1 ♀ (paratype) Fraser's Hill, Pahang, 4,000 ft., June 1933. All taken by H. M. Pendlebury.

Cobanilla phædra Collnt.

Cobanilla phædra Collnt., Nov. Zool., XXXVIII, p. 81, 1932.

This species was described from a single Penang male. Further specimens are included in the present collection, as follow:—1 ♂, Gunong Kledang, Perak, 2,600 ft., November 1917, E. Seimund; 1 ♂, The Gap, Pahang, May 1920; 2 ♂ ♂, Bukit Kutu, Selangor, 3,400 ft., August and December 1915, and 1 ♂ from the same locality, 3,500 ft., September 1929, H. M. Pendlebury.

Pantana macrotera sp. n. (Fig. 4).

♀. Resembles *P. adara* Moore (1859), but with the three snuff brown spots below the extremity of the cell considerably larger, and with the hind-wing pale pinkish buff instead of "pale dull brownish-testaceous." The expanse is also greater and the veins of the fore-wing lighter than the ground colour.

♂. Resembles the ♀.

Expanse: ♀ ♀ 43–49 mm., ♂ 36 mm.

1 ♂ (holotype) and 1 ♀ (paratype), Sarawak, Borneo, February 1908, G. Meade Waldo, (British Museum collection); 1 ♂ (allotype) Mount Kinabalu, North Borneo, August 1903, John Waterstradt, (British Museum, ex Oberthür collection); 1 ♀, Bettotan, near Sandakan, North Borneo, July 1927, C. Boden Kloss and H. M. Pendlebury.

Lymantria similis Moore.

Lymantria similis Moore, Proc. Zool. Soc. Lond., p. 402, 1879.

This species has not previously been recorded from Malaya.

Included in the present collection is a single male from Bukit Kutu, Selangor, at light, 3,300 ft., September 1932, H. M. Pendlebury.

The hindwing is lighter than in Indian specimens and shows a distinct dark band subterminally.

The insect bears considerable resemblance to specimens of *L. ganaroides* Strand, but is certainly distinct.

XLVII. FOUR NEW MALAYAN MEMBRACIDÆ.

By W. D. FUNKHOUSER, *University of Kentucky.*

(With four text figures).

In February, 1933, the writer had the pleasure of spending three weeks in Kuala Lumpur, and through the very kind assistance of Mr. H. M. Pendlebury of the Selangor Museum, was given the opportunity of collecting during this period in this part of the Malay Peninsula. As a result of the many courtesies extended by Mr. Pendlebury, a distinguished entomologist and charming host, who was most generous of his time in making trips to the neighbouring jungles and pointing out the best areas for collecting, a considerable number of Membracidæ were taken, among which are four species which are here described as new.

1. **Gargara dorsata** sp. n. (Fig. 1).

Large, dark brown; punctate, pubescent; posterior process distinctly elevated in middle portion, tip black; tegmina opaque and dark brown; legs and undersurface of body brown.

Head subquadrate, wider than long, dark brown, finely punctate, sparingly pubescent; base arcuate and sinuate; eyes large, prominent, dark brown; ocelli large, white, prominent, farther from each other than from the eyes and situated well above a line drawn through centres of eyes; clypeus much darker brown than the rest of the face, extending for nearly half its length below inferior margins of genæ, tip truncate and pilose.

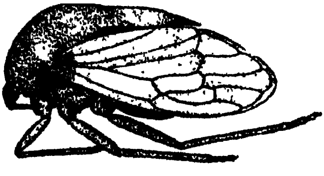


Fig. 1. *Gargara dorsata* sp. n.

Pronotum dark brown, finely punctate, sparingly pubescent; metopidium convex, wider than high; median carina distinctly percurrent; humeral angles large, prominent, triangular, blunt; posterior process heavy, robust, distinctly elevated in its middle portion which is lighter in colour than the rest of the pronotum, tip sharp, black, extending just to internal angles of tegmina; scutellum well exposed.

Tegmina broad, opaque, wrinkled, dark brown; base broadly brown, coriaceous and punctate; limbus narrow; veins heavy and distinct; five apical and three discoidal cells.

Undersurface of body uniformly dark brown; femora dark brown; tibiæ and tarsi lighter brown.

Length from front of head to tips of tegmina 5 mm.; width between humeral angles 2.7 mm.

Type: female.

The males are smaller, darker and with the tegmina less opaque, in some cases being almost hyaline.

Type locality: Ulu Klang, Federated Malay States.

Described from five females and five males. With the adults were taken a number of nymphs in various instars. Both adults and nymphs were attended by the common small long-legged ant, *Plagiolepis longipes.* Type, allotype and six paratypes in author's collection; two paratypes and nymph in British Museum collection.

2. **Gargara selangori** sp. n. (Fig. 2).

Small, brown, punctate, pubescent; metopidium convex; posterior process reaching just beyond internal angles of tegmina; tegmina entirely opaque brown with a darker brown fascia just before apex; undersurface and legs dark brown.

Head twice as wide as long, finely punctate, densely pubescent; base sinuate; eyes brown; ocelli large, conspicuous, pearly, twice as far from each other as from the eyes and situated well above a line drawn through centres of eyes; clypeus extending for half its length below inferior margins of genæ, base broadly truncate and pilose.

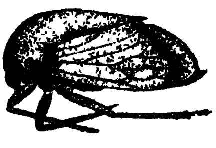


Fig. 2. *Gargara selangori* sp. n.

Pronotum brown, darker on frontal margin of metopidium and tip of posterior process; finely punctate, densely pubescent; metopidium convex, wider than high; humeral angles prominent, triangular, acute; median carina obsolete; posterior process tectiform, tip sharp, very dark brown and extending just beyond internal angles of tegmina; scutellum broadly exposed on each side.

Tegmina brown, opaque; a transverse fascia of darker brown just before apex; limbus narrow; base narrowly coriaceous and punctate; veins indistinct; five apical and three discoidal areas.

Undersurface of body dark brown; femora and tibiæ brown; tarsi ferruginous.

Length from front of head to tips of tegmina 3.8 mm.; width between humeral angles 2 mm.

Type: female.

Type locality: Selangor, Federated Malay States.

Described from a single specimen in the author's collection.

3. **Gargara tigris** sp. n. (Fig. 3).

Small, punctate, not pubescent; pronotum and legs bright yellow; head and sides of thorax jet black; metopidium sloping; posterior process extending just beyond internal angles of tegmina; tegmina hyaline. Easily recognized by the brilliant yellow and black coloration.

Head jet black, subquadrangular, twice as wide as long, finely punctate, sparingly pubescent; base smoothly arcuate; eyes yellow-brown; ocelli large, prominent, pearly, twice as far from each other as from the eyes and situated above a line drawn through centres of eyes; clypeus black, extending for two-thirds its length below inferior margins of genæ, tip broadly truncate and pilose; margins of genæ bordered with yellow.

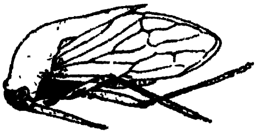


Fig. 3. *Gargara tigris* sp. n.

Pronotum bright yellow, finely punctate, not pubescent; metopidium sloping, much broader than high; humeral angles prominent, triangular, blunt; median carina strongly percurrent; posterior process tectiform, slightly depressed at base, strongly carinate, tip acute and reaching just beyond internal angles of tegmina; scutellum narrowly exposed on each side.

Tegmina hyaline; base narrowly coriaceous, yellow and punctate; limbus narrow; veins indistinct; five apical and two discoidal areas.

Sides of thorax and bases of femora shining black; abdomen bright yellow; tibiæ and tarsi yellow.

Length from front of head to tips of tegmina 4.2 mm.; width between humeral angles 2.2 mm.

Type: female.

Type locality: Ulu Klang, Federated Malay States.

Described from a single specimen in the author's collection.

4. **Tricentrus spinis** sp. n. (Fig. 4).

Large, brown, punctate, pubescent; suprahumerals and posterior process very sharp and spine-like; suprahumerals half as long as the distance between their bases; posterior process extending just beyond internal angles of tegmina; tegmina smoky hyaline; undersurface and legs brown. Near *T. spinidorsis* Funkh. but larger and differing in coloration and particularly in the position and character of the suprahumerals.

Head dark brown, subquadrate, twice as wide as high, finely punctate, densely pubescent with long golden hairs; base arcuate and slightly sinuate; eyes large, prominent, yellow-brown; ocelli large, amber-coloured, equidistant from each other and from the eyes and situated somewhat above a line drawn through centres of eyes; clypeus extending for about half its length below inferior margins of genæ, tip broadly rounded and densely pilose.

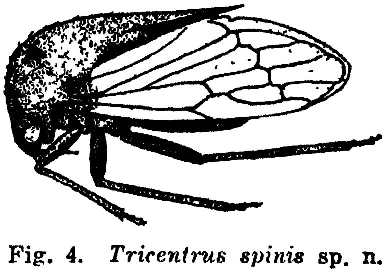


Fig. 4. *Tricentrus spinis* sp. n.

Pronotum brown, finely punctate, sparingly pubescent; metopidium convex, a little wider than high a dark foveate spot above each eye; humeral angles triangular, blunt; median carina percurrent; suprahumeral horns short, very sharp, extending outward and only slightly upward, triquerate, half as long as the distance between their bases; posterior process straight, triquerate, very acuminate, tip darker and extending just beyond the internal angles of the tegmina; scutellum broadly exposed on each side.

Tegmina smoky hyaline, wrinkled; base narrowly coriaceous, brown and punctate; limbus narrow; veins strong, brown; five apical and three discoidal areas.

Sides of thorax and undersurface of body brown; femora dark brown; tibiæ and tarsi ferruginous brown.

Length from front of head to tips of tegmina 6.8 mm.; width between tips of suprahumeral horns 4 mm.

Type: female.

Type locality: Kuala Lumpur, Federated Malay States.

Described from the type specimen and from a male which has stood undetermined in the author's collection for many years and which was collected by Professor C. F. Baker at Singapore. This male undoubtedly belongs to the species here described.

Type and allotype in the collection of the author.

XLVIII. MALAYAN ALEURODIDÆ.

By G. H. CORBETT, B.SC., F.R.E.S.

Government Entomologist, Department of Agriculture, S.S. & F.M.S.

(With one hundred and five text figures).

The presence in Malaya of one hundred and twenty-four species of Aleurodidæ is recorded in this paper. Of these, twenty species have been described previously by other workers and thirteen by the writer, while ninety-one new species are now described.

The material for this paper has been collected mostly in the vicinity of Kuala Lumpur, Selangor, and undoubtedly many other species await discovery. Increasing interest has been displayed in recent years in the study of this Family and, although all its described members are small, (*Dialeurodes evodiæ* Corb., one of the largest known species is only about 2.03 mm. in length) some have attained considerable economic importance to plants and have been proved to transmit virus diseases.

I wish to express my grateful thanks to Mr. K. Anthony, recently Artist, and to Che' Razaly, Artist, of the Department of Agriculture, S.S. and F.M.S. for their willing assistance in preparing the illustrations, and to Capt. H. M. Pendlebury, Systematic Entomologist and Curator, Selangor Museum, for kindly attending to the proofs and for publishing the report in this *Journal.*

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ALEURODIDÆ OF MALAYA WITH DESCRIPTIONS OF NEW SPECIES.

Subfamily ALEURODICINÆ Quaintance and Baker, 1913.

Classification of the Aleyrodidæ, Part I," Technical Series, No. 27, Part I, U. S. Dept. Agriculture, 1913.

Genus **Aleurodicus** Douglas.

Aleurodicus Morgan, Ent. Mo. Mag. (2) Vol. 3, p. 32, 1892.

Aleurodicus destructor Mackie. (Fig. 1).

Aleurodicus destructor Quaintance Mackie, Philippine Agricultural Review, Vol. 5, p. 142 (1912).

Aleurodicus destructor Mackie, U. S. Dept. Agriculture, Technical Series, No. 27, Part 1, p. 56, (1913).

This Aleurodid was first received from Manila by Quaintance in 1911 with a note to the effect that the stems of young fruit were sometimes so infested with this insect that coconut palms failed to set fruit. *Aleurodicus destructor* is sparsely distributed throughout Malaya and on its account the importation of palms into Malaya was probably prohibited.

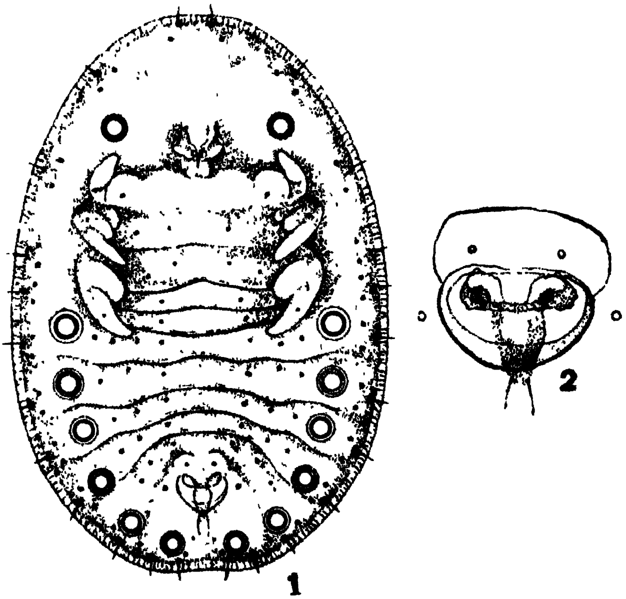

Fig. 1. *Aleurodicus destructor* Mackie.
1. Pupa case. 2. Vasiform orifice.

Hosts in Malaya—*Cocos nucifera* and *Anona squamosa.*

Localities—Johore, Selangor, Perak and other States.

It is possible that *Aleurodicus destructor* Mackie (1912) is synonymous with *Aleurodicus anonæ* Morgan (1892).

Subfamily ALEYRODINÆ Enderlein (1909).

Zoologischen Anzeiger, Bd. 34, No. 7/8, 1909.

Genus **Dialeurodes** Cockerell (1902).

Proc. Acad. Nat. Science, Philadelphia, 1902, p. 280.

Dialeurodes selangorensis Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—*Cinnamomum camphora.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes filamentosa Corb.

Stylops, Vol. 2, Part 6, June 1933.

Hosts—*Baccaurea motleyana, Phyllanthus frondosus* and *Morinda* sp.

Localities—Johol, Kuala Pilah (Negri Sembilan), Kampong Bahru and Kuala Lumpur (Selangor).

Dialeurodes punctata Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Dialeurodes cyathispinifera Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Dialeurodes spiniferosa Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—*Diospyros* sp.

Locality—Kuala Lumpur (Selangor).

Dialeurodes distincta Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Dialeurodes shoreæ Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—*Shorea glauca.*

Locality—Juru Hill, Province Wellesley.

Dialeurodes bifurcata Corb.

Stylops, Vol. 2, Part 6, June 1933.

Hosts—*Nephelium lappaceum, Nephelium mutabile.*

Localities—Kuala Lumpur, Pudu (Selangor).

Dialeurodes tridentifera Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—*Cinnamomum camphora.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes bipunctata Corb.

Stylops, Vol. 2, Part 6, June 1933.

Host—*Gluta* sp.

Locality—Puchong (Selangor).

Dialeurodes adinandræ sp. n. (Fig. 2).

Pupa case yellowish-white, without lateral or dorsal secretion, closely applied to undersurface of leaf. Shape broadly elliptical, broadest across first abdominal segment, narrowing posteriorly, somewhat flattened anteriorly. Submarginal area differentiated into two areas; both being moderately wide and more marked anteriorly. The whole of the case including cephalo-thorax and abdomen crowded with minute spots and covered with large subcircular

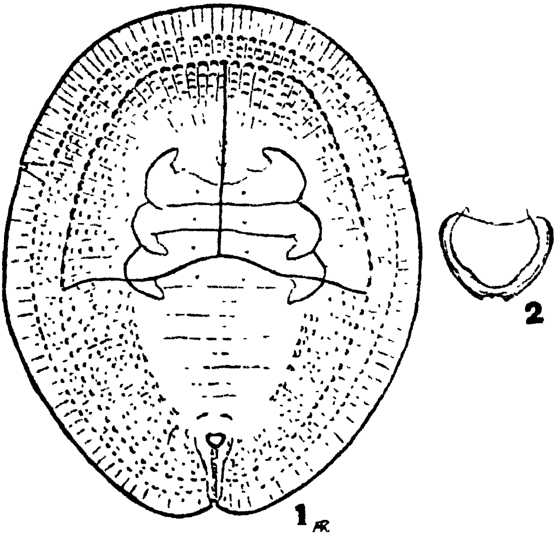

Fig. 2. *Dialeurodes adinandræ* sp. n.
1. Pupa case. 2. Vasiform orifice.

markings. Transverse suture extends to inner differentiation, and there joining the cephalic suture meets anteriorly the mid-thoracic suture. The cephalic suture appears to continue around the case posteriorly but examination shows that this is due to a more pronounced marking. Tracheal folds evident to cephalic suture, without apparent markings and ending at margin in an even circular pore. Caudal fold conspicuously dotted and ending at margin in a circular pore. Vasiform orifice subcordate, without teeth on inner or lateral margins, outer posterior margin slightly recessed and appears to have a small central tooth; operculum similar in shape, obscuring lingula.

Length 0.75 mm., breadth 0.65 mm.

Hosts—*Adinandra dumosa* and *Ficus* sp.

Locality—Port Dickson (Negri Sembilan).

This species is readily distinguished from *Dialeurodes psidii* sp. n. (*infra*) essentially by the absence of conspicuous subdorsal tubercles.

Dialeurodes psidii sp. n. (Fig. 3).

Pupa case closely applied to undersurface of leaf, whitish, no dorsal or lateral secretion. Shape elliptical. Margin very finely crenulate. No marginal spines evident.

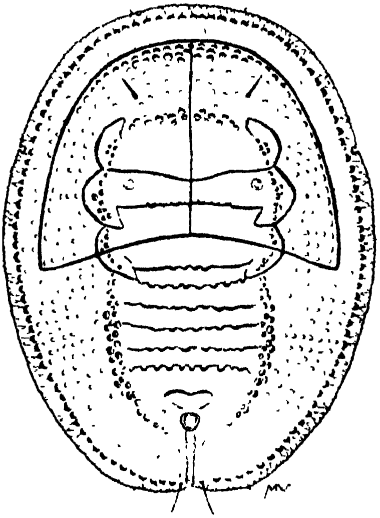

Fig. 3. *Dialeurodes psidii* sp. n.
Pupa case.

Submarginal area narrow, differentiated by a ring of papilla-like markings. Area between this ring and subdorsum granular. Subcircular markings are irregularly distributed throughout case. Disc demarked by irregularly-shaped small tubercles, none conspicuously larger than others. Thoracic and abdominal segments defined by corrugations on sutures. Transverse suture distinct meeting cephalic suture which in turn is joined by mid-thoracic suture. Near and posterior to cephalic suture, especially anteriorly, papilla-like tubercles are prominent. Case with a pair of spines anteriorly in cephalo-thorax and at termination of caudal fold. Occasionally a pair on first abdominal segment is indicated. Tracheal pore chitinised, opens at margin and is without teeth. Tracheal fold generally only slightly indicated near margin. Caudal pore and fold conspicuous, the latter dotted. Vasiform orifice subcordate, broadly recessed at posterior outer margin, without lateral or caudal teeth; operculum nearly fills orifice, obscuring lingula.

Length 0.72 mm., breadth 0.58 mm.

Hosts—*Psidium guajava, Conocephalus subtrinervius, Artocarpus* sp. and *Michelia champaca.*

Locality—Kuala Lumpur (Selangor).

Material collected from *Ardisia colorata* at Cameron Highlands (4,500–5,000 feet), is similar to and may be identical with *D. psidii,* but the subcircular markings appear to be larger and the granular markings are not so prominent.

Dialeurodes kamardini sp. n. (Fig. 4).

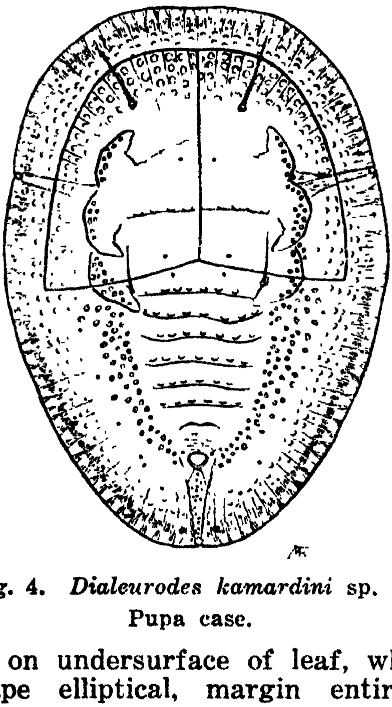

Fig. 4. *Dialeurodes kamardini* sp. n.
Pupa case.

Pupa case on undersurface of leaf, whitish, without secretion. Shape elliptical, margin entire, incised by marginal sutures. Tracheal pore circular, not armed with fimbriæ; fold, without spots or marks, delineated to rudimentary legs; caudal similar to tracheal pore, fold dotted, broadens out and gradually narrows to caudal pore. Cephalic suture prominent and met by mid-thoracic and transverse sutures. Area from margin to dorsal disc with crescentic markings and from near vasiform orifice, disc defined by small tubercles. Similar sized tubercles line the abdominal and thoracic sutures. A pair of spines is situated anteriorly on cephalo-thorax, on first abdominal segment and in from the margin near termination of caudal fold. Two rings of small submarginal spines, the outer ring being smaller and more closely arranged. Vasiform orifice subcordate, inner margin without teeth, posterior outer margin slightly divided, operculum similarly shaped and filling orifice.

Length 0.60 mm., breadth 0.42 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species is named after the collector, Che Kamardin, Malay Agricultural Assistant.

It is very similar to *Dialeurodes psidii* Corb., the principal differences being in the size and shape of caudal fold. *D. kamardini* is comparatively more elongate than *D. psidii.*

Dialeurodes rhodamniæ sp. n. (Fig. 5).

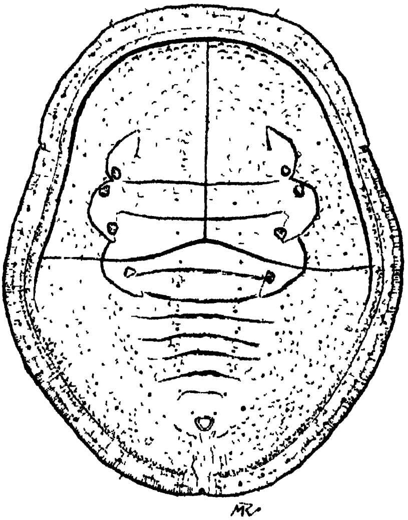

Fig. 5. *Dialeurodes rhodamniæ* sp. n.
Pupa case.

Pupa case on undersurface of leaf, flat, yellowish with vasiform orifice dark, no secretion evident. Shape subovate, slightly emarginate at thoracic and caudal pores. Margin entire, sutures prominent to dorsal disc. The submargin is differentiated by a fold and in its vicinity a ring of tooth-like projections about 0.06 mm. from margin. Within submarginal area, a ring of minute spines is present. Similar spines generally distributed throughout case and two pairs are present on each abdominal segment. Thoracic pore represented by a circular ring opening just within margin; tracheal fold not evident. Caudal fold narrow, terminating in a pore just within margin. Thoracic and abdominal segments distinct, sutures with corrugations. The mid-thoracic, transverse and cephalic sutures distinct, the latter running along the inside of the ring of submarginal projections. The cephalic suture is prolonged a short distance posterior to transverse suture. Vasiform orifice subcordate, operculum similar in shape obscuring lingula.

Length 0.52 mm., breadth 0.50 mm.

Hosts—*Rhodamnia cinerea*, *Ficus* sp., *Gluta* sp., *Eugenia aquea*, *Sterculia lævis*, *Eugenia malaccensis* and *Michelia champaca*.

Localities—Kuala Lumpur and Sepang (Selangor).

Dialeurodes sembilanensis sp. n. (Fig. 6).

Pupa case flat, on undersurface of leaf, singly, yellowish, without apparent secretion. Shape broadly elliptical. Margin composed of a series of closely placed wax tubes from which suture-like markings extend to subdorsal area of case. Entire case crowded with small spots, less distinct in submarginal area. Tracheal and caudal

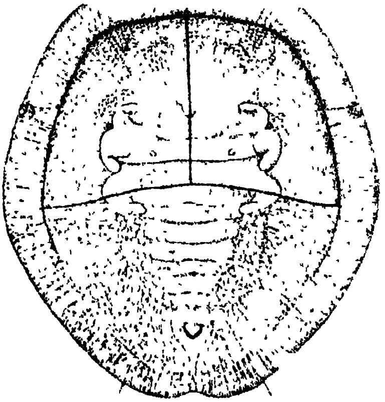

Fig. 6. *Dialeurodes sembilanensis* sp. n.
Pupa case.

pores open at margin. Tracheal fold distinct, without apparent markings. Caudal fold narrow with moderately large spots ending in distinct pore. Transverse and thoracic sutures distinct. Transverse suture meets cephalic suture which runs about 0.07 mm. from margin and joins thoracic suture in mid-dorsal line. The cephalic suture does not extend posteriorly but the submargin is markedly differentiated. Submarginal area with a ring of small spines. Abdominal segments distinct with sutures somewhat corrugated. Vasiform orifice small, subcordate and without teeth, operculum fills orifice and obscures lingula.

Length 0.65 mm., breadth 0.58 mm.

Host—*Ficus* sp.

Localities—Port Dickson and Johol (Negri Sembilan).

Dialeurodes curcumæ sp. n. (Fig. 7).

Pupa case on undersurface of leaf, yellowish, no secretion evident. Shape elongate-elliptical. Margin crenulate. Submarginal area posterior to transverse suture generally differentiated by a ring of larger crescent-like markings. Submarginal and subdorsal areas with small crescentic markings. Thoracic and caudal pores distinct, tracheal fold without dots and merely indicated in submargin, caudal fold conspicuously dotted. Dorsal disc entirely surrounded by small papillæ and conspicuously corrugated. Corrugations less evident in mid-dorsal area. Abdominal sutures distinct. A pair of long spines is present anteriorly in cephalo-thorax. Transverse suture meets cephalic suture

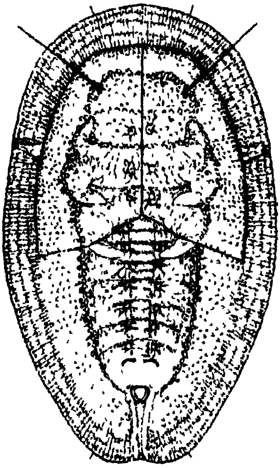

Fig. 7. *Dialeurodes curcumæ* sp. n.

Pupa case.

which in mid-dorsal line joins thoracic suture, thus demarking anteriorly the submarginal area. Submarginal area about 0.05 mm. wide. Vasiform orifice subcordate, broadly recessed at outer posterior margin and with a small tooth in middle, operculum fills entire orifice obscuring the lingula.

Length 0.85 mm., breadth 0.55 mm.

Host—*Curcuma* sp.

Locality—Sepang (Selangor).

Dialeurodes lumpurensis sp. n. (Fig. 8).

Pupa case without secretion, on undersurface of leaf, white with yellowish coloured vasiform orifice. Shape elliptical, widest across region of first abdominal segment, slightly emarginate at region of thoracic pores. Marginal area differentiated by a fold around case from which arise about sixteen conically-shaped papillæ anterior to and about twenty-six posterior to each thoracic pore. Margin entire but incised by sutures which extend to dorsal disc. Transverse suture distinct and turns anteriorly to meet thoracic suture in mid-dorsal line. Thoracic and caudal pores circular opening at margin. Thoracic fold generally ill-defined, caudal fold moderately prominent and sparsely dotted. Tubercles near rudimentary legs conspicuous but not so evident at periphery of abdominal segments. Similar tubercles are situated anteriorly in the cephalo-thorax and

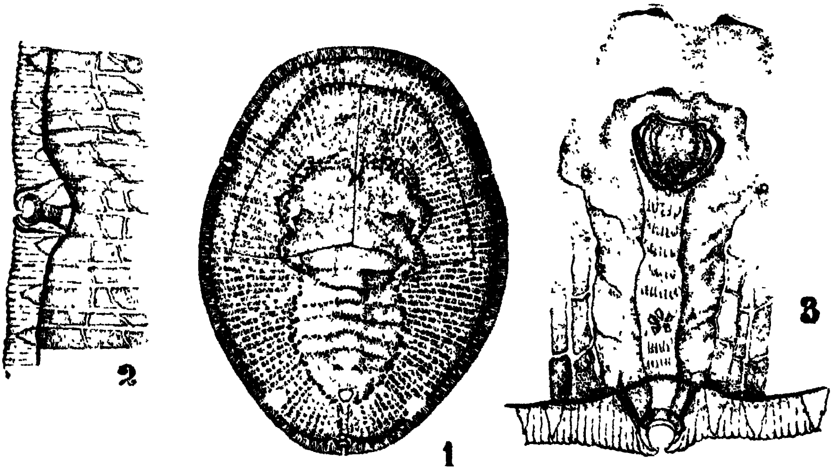

Fig. 8. *Dialeurodes lumpurensis* sp. n.

1. Pupa case.
2. Tracheal pore.
3. Vasiform orifice and caudal fold.

posterior to cephalic suture. Dorsal disc somewhat corrugated and thoracic and abdominal sutures fairly evident. Ill-defined somewhat circular markings distributed throughout case. Vasiform orifice small and subcordate, operculum similar in shape, obscuring lingula.

Length 0.66 mm., breadth 0.5 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Dialeurodes reticulosa sp. n. (Fig. 9).

Pupa case on leaf, whitish without evident secretion. Shape subovate, slightly constricted posterior to thoracic pores. Margin entire, composed of a series of closely placed tubes from which extend suture like markings. No marginal spines present, marginal band differentiated. Tracheal pore regular, opening at margin, fold conspicuously dotted with large spots, especially in subdorsal area.

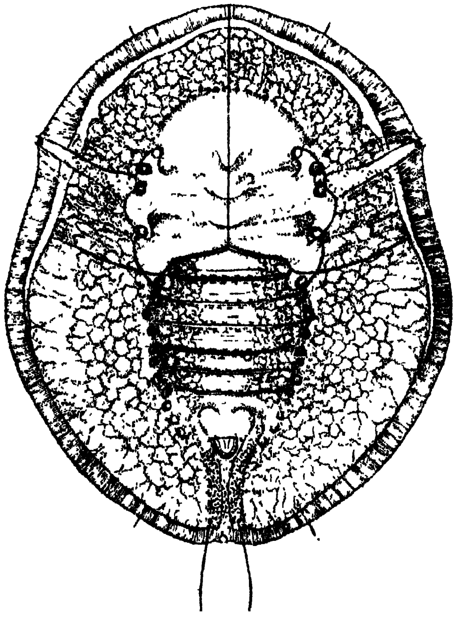

Fig. 9. *Dialeurodes reticulosa* sp. n.
Pupa case.

Caudal pore opens at margin, fold and surrounding area spotted. Thoracic suture to margin, transverse suture to marginal band. Abdomen subdorsally with about eleven pairs of conspicuous tubercles, also four similar pairs in cephalo-thorax. Dorsum between marginal band and subdorsal area granulate and without prominent spines.

Ventral surface markedly reticulate. Abdominal sutures distinct without chitinised thickenings. Vasiform orifice subcordate, inner and lateral margins armed with about twelve teeth subequal in size, operculum almost fills orifice, obscuring lingula.

Length 1.12 mm., breadth 0.80 mm.

Host—*Alyxia Forbesii.*

Locality—Johol (Negri Sembilan).

Dialeurodes panacis sp. n. (Fig. 10).

Pupa case numerous on both upper and lower surfaces of leaf, delicate, somewhat silvery, vasiform orifice yellowish, no secretion evident. Shape subovate, slightly emarginate at thoracic and caudal pores. Margin entire, marginal sutures evident. Tracheal and caudal pores open within margin. Tracheal fold prominent running to subdorsum and covered with minute spots. Caudal groove narrow, with its immediate area demarked and covered with dots. Thoracic suture extends to margin, transverse to subdorsal area. Abdominal and thoracic sutures evident on mid-dorsum and without corrugations. In some specimens numerous small spots anterior to abdominal sutures are conspicuous. Case without prominent spines or pores but with three pairs of globular tubercles on anterior half. Vasiform orifice subcordate, slightly rounded anteriorly,

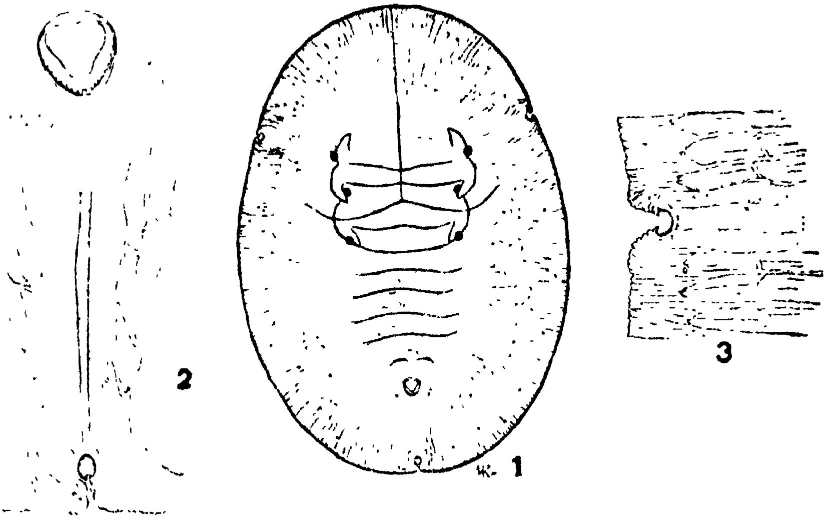

Fig. 10. *Dialeurodes panacis* sp. n.

1. Pupa case.
2. Vasiform orifice and caudal fold.
3. Tracheal pore and fold.

lateral and posterior margins with about twenty minute teeth and with a prominent tooth in the middle, posterior outer margin not recessed. Operculum is slightly constricted about its middle and narrows posteriorly: lingula obscured.

Length 1.36 mm., breadth 1.06 mm.

Host—*Panax fruticosum.*

Localities—Sepang, Kuala Lumpur (Selangor).

This species is similar to *Dialeurodes kirkaldyi* Kot., but differs essentially in the presence of a prominent tooth from the inner posterior margin of vasiform orifice and in the teeth from the inner margin of vasiform orifice being distinctly smaller.

Dialeurodes conocephali sp. n. (Fig. 11).

Pupa case on undersurface of leaf, yellowish without dorsal or lateral secretion. Shape subovate, emarginate at thoracic pores. Margin entire incised by sutures which run into subdorsal area. Area between margin and subdorsum granulate, slightly more prominent in subdorsal area. Thoracic pores open at margin, folds conspicuously but sparsely dotted run to subdorsum. Caudal pore opens within margin, fold narrow and surrounded by a differentiated area. Caudal fold and differentiated area without

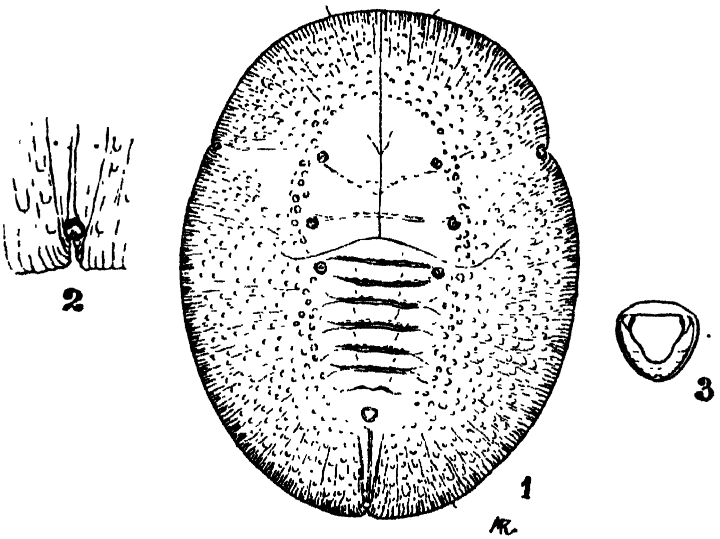

Fig. 11. *Dialeurodes conocephali* sp. n.

1. Pupa case.
2. Caudal pore.
3. Vasiform orifice.

spots. Minute pores (spines) are sparsely distributed throughout case. Transverse suture ends mid-way between subdorsum and margin. Mid-thoracic suture extends to margin. Abdominal and thoracic sutures thickened and rendered more evident by small tubercle-like structures. Three pairs—two in the cephalo-thorax and one laterally on second abdominal segment—of globular tubercles are prominent. Vasiform orifice subcordate, anteriorly thickened and anterior margin slightly protruding. Inner lateral and posterior margins armed with minute teeth and from mid-posterior margin a projection is prominent. Operculum narrower and shorter than orifice, somewhat conical in shape. Lingula obscured.

Length 1.26 mm., breadth 0.98 mm.

Host—*Conocephalus subtrinervius.*

Locality—Kuala Lumpur (Selangor).

The species differs from *D. gardeniæ* sp. n. (*infra*) by having spotted tracheal folds and from *D. tuberculatus* Tak., in the prominent abdominal sutures and the emargination of case near thoracic pore.

Dialeurodes gardeniæ sp. n. (Fig. 12).

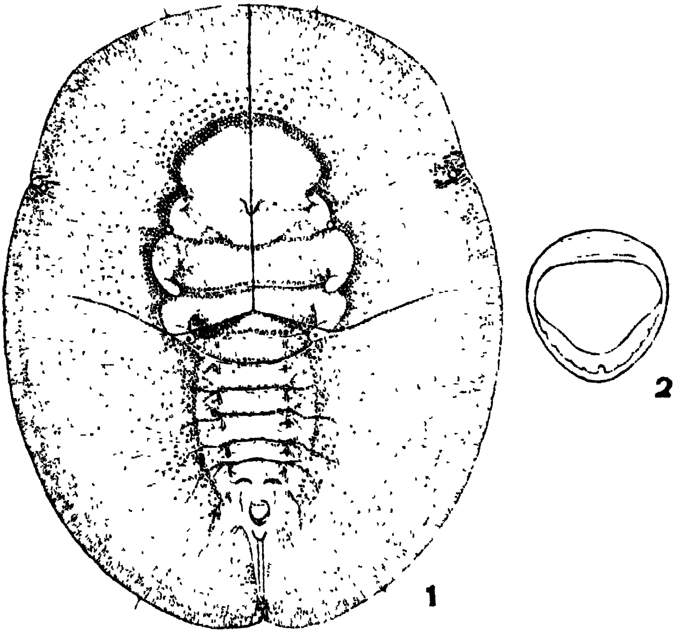

Fig. 12. *Dialeurodes gardeniæ* sp. n.

1. Pupa case.
2. Vasiform orifice.

Pupa case singly, on undersurface of leaf, without wax secretion, yellowish, frequently iridescent, vasiform orifice sometimes reddish. Shape subovate, constricted at thoracic and recessed at caudal pore. Margin finely crenulate. Thoracic suture to margin. Transverse suture turning slightly anteriorly ends in submarginal area. A pair of small but distinct tubercles is situated laterally near the first thoracic suture and laterally on the second abdominal segment. Abdominal segments distinct, sutures slightly chitinised. Case with exception of dorsal disc with granular markings, denser in subdorsal area and especially so anteriorly in cephalo-thorax. Tracheal fold not very evident, appears to be striated particularly near pore which is armed with small sinuses and opens slightly in from margin. Caudal groove narrow, without markings, surrounded with a differentiated area and terminates in pore within margin. Vasiform orifice subcordate, finely toothed with prominent projection on inner posterior margin. Operculum absent in both representatives.

Length 1.50 mm., breadth 1.17 mm.

Host—*Gardenia florida.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes kirkaldyi (Kotinsky). (Fig. 13).

Aleurodes kirkaldyi Kotinsky, Bd. Agric. and Forestry, Hawaii, Bull. 2, p. 95, 1907.

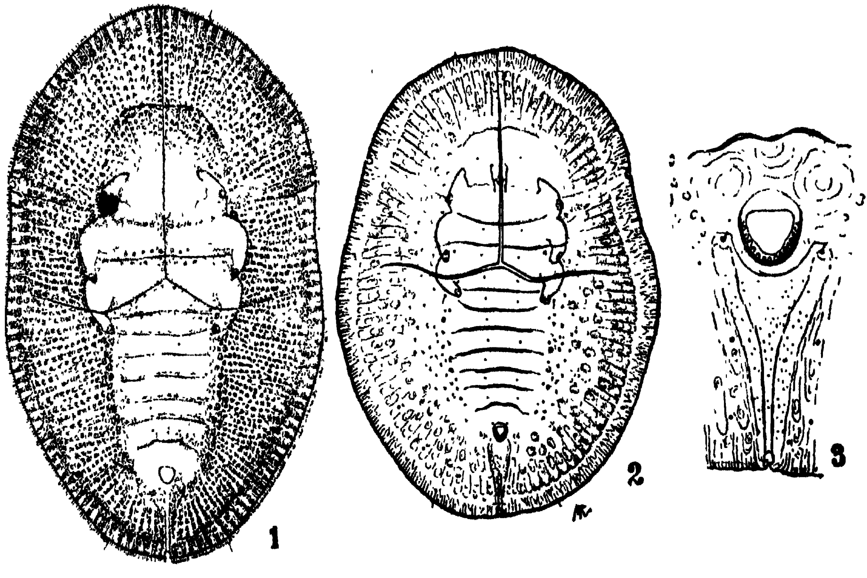

Fig. 13. *Dialeurodes kirkaldyi* (Kot.)

1. Pupa case, male.
2. Pupa case, female.
3. Vasiform orifice of 1.

Dialeurodes kirkaldyi Quaintance and Baker, U.S. Dept. Agric. Tech. Series, 27/11, p. 98, 1914.

Dialeurodes kirkaldyi Bodkin, Dept. Sci. Agric. Brit. Guiana, 1914/15.

Dialeurodes kirkaldyi Kotinsky, Bull. No. 139, Priesner and Hosny.

This species is recorded from Hawaii, British Guiana and Egypt on jasmine, *Hiptage madablota*, *Terminalia* sp. and *Malva silvestris.*

Quaintance and Baker and Priesner and Hosny may have considered the female pupa case of *Dialeurodes kirkaldyi* to be that which is broadly elliptical, about 1.20 mm. in length and without (or with insignificant) tubercles defining the dorsal disc. Other pupa cases which are generally present with the broadly elliptical ones, I have considered to be the male cases of this species. These are much narrowed, have generally moderately prominent tubercles defining the dorsal disc, granular markings between the margin and dorsal disc and in length about 0.86 mm. and breadth 0.70 mm. There is, however, a considerable variation in the prominence of the tubercles but little in the shape and size of the male pupa cases.

Hosts in Malaya—*Jasminum* sp., *Plumeria acutifolia*, *Morinda citrifolia* and *Fagræa fragrans.*

Localities—Sepang and Kuala Lumpur (Selangor).

Dialeurodes endospermi sp. n. (Fig. 14).

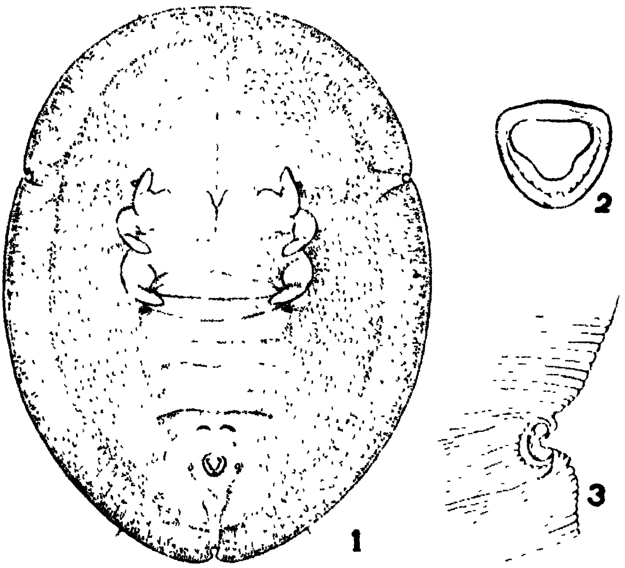

Fig. 14. ***Dialeurodes endospermi*** **sp. n.**

1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

Pupa case on undersurface of leaf, slightly convex, whitish and with no evident secretion. Shape elliptical, slightly emarginate at tracheal and caudal pores. Margin entire, marginal sutures prominent and distinct to subdorsum. Area between submargin and subdorsal area crowded with what appear to be small circular clear spots. A ring of small spines near margin is evident and similar sized spines throughout dorsum. No subdorsal abdominal tubercles present. Mid-thoracic suture reaches margin, transverse suture in vicinity of third pair of rudimentary legs turns anteriorly and ends before reaching margin. Tracheal pore armed with fimbriæ and situated slightly in from margin, fold distinct and spotted. Caudal similar to tracheal pore. Caudal fold from vasiform orifice to pore markedly dotted. Vasiform orifice subcordate, anterior margin slightly convex, armed on inner margin with about twenty minute teeth and with a projection from its inner posterior margin. Operculum constricted, somewhat truncated posteriorly and fills about two-thirds of orifice. Lingula obscured.

Size varies, largest specimen, length 1.40 mm., breadth 1.05 mm.

Host—*Endospermum malaccense.*

Locality—Kuala Lumpur (Selangor).

This species in its shape and in its possession of a prominent tooth from inner posterior margin resembles *D. conocephali* but differs from it in not having the abdominal sutures corrugated.

Dialeurodes octoplicata sp. n. (Fig. 15).

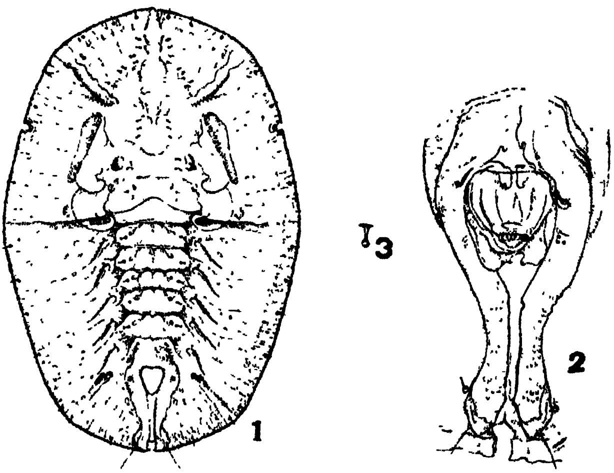

Fig. 15. *Dialeurodes octoplicata* sp. n.

1. Pupa case.
2. Vasiform orifice and caudal fold.
3. Capitate spine from an abdominal segment.

Pupa case on undersurface of leaf, whitish in appearrance, without waxy secretion. Margin very finely incised; shape octahedral, angles at prolongation of rhachis anteriorly, at terminations of three pairs of folds from dorsal disc, and at caudal fold posteriorly. Broadest across region of first abdominal segment. Elliptical pore-like areas through subdorsal area, each appears to be armed with two minute thickened or knobbed spines. About twelve pairs of submarginal small vasiform spines—tips just reaching margin. Each abdominal segment with a pair of capitate-like spines together with pore-like areas. Abdominal sutures distinct: five pairs of abdominal folds not extending to margin. Tracheal pores open at margin, folds indistinct. Vasiform orifice subcordate, without teeth on lateral or caudal margin. Operculum similar in shape, tip of lingula just exposed. Caudal fold distinct running to margin. Orifice and fold surrounded by conspicuous demarked area. (In the specimen the vasiform orifice is slightly broken).

Length 1.00 mm., breadth 0.70 mm.

Host—*Cinnamomum* sp.

Locality—Kuala Lumpur (Selangor).

This species which has been described from one specimen resembles *Dialeurodes machili* Takahashi, but may be distinguished from it by the forward prolongation and the three pairs of folds reaching margin.

Dialeurodes erythrinæ sp. n. (Fig. 16).

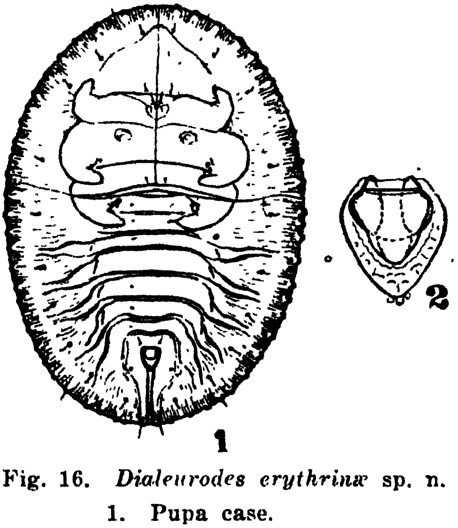

Fig. 16. *Dialeurodes erythrinæ* sp. n.

1. Pupa case.
2. Vasiform orifice.

Pupa case closely applied to undersurface of leaf, creamy, with vasiform orifice yellowish, and fifty-four whitish rods around case. Shape elliptical. Margin crenulate. Tracheal pore only very slightly indicated and fold sparsely covered with spots between first and second pair of rudimentary legs. Transverse and thoracic sutures distinct, the former terminating at submarginal area and the latter at margin. In addition to the fifty-four rounded papillæ near margin, the submarginal area has an almost regular ring of about ten pairs of small spines. (In some specimens these spines are much longer than those figured). A similar pair of spines is situated anteriorly on cephalothorax, on first abdominal segment and laterally near vasiform orifice: a longer pair of spines near extremity of caudal groove and a shorter pair on anterior and posterior lateral margins complete the arrangement of the spines. Abdominal segments form a distinct rhachis with folds extending to submarginal area. A trilobed area surrounds vasiform orifice and forms a caudal groove to margin of case. Vasiform orifice cordate, operculum similar in shape and almost completely fills orifice; in some specimens, the knobbed lingula is seen through the operculum.

Length about 0.97 mm. and breadth about 0.76 mm.

Hosts—*Erythrina stricta, Erythrina lithosperma.*

Localities—Kuala Pilah (Negri Sembilan) and Malacca.

This species is related to the subgenus *Rhachisphora.* The submarginal papillæ around the case have been considered as representing spines. The rhachis is a conspicuous character of the species.

Dialeurodes decempunctata Q. & B.

The subgenus *Dialeuropora* was erected to receive *Dialeurodes decempunctata* on account of a series of very large submarginal pores. It was collected by R. S. Woglum on Cinnamon in the Royal Botanic Garden, Ceylon. and also on Mulberry at Lahore, India.

My collection possesses the posterior half of a pupa case of a species of *Dialeurodes* (*Dialeuropora*) from Cinnamon and in so far that *D. decempunctata* was originally described by Quaintance and Baker from Cinnamon the writer here records its possible presence in Malaya.

Host in Malaya—*Cinnamomum* sp.

Locality—Kuala Lumpur (Selangor).

Dialeurodes setigerus Takahashi. (Fig. 17).

"Aleyrodidæ of Formosa, Part 1", Dept. Agriculture, Japan, Report 59, page 14, 1932.

If Quaintance and Baker's drawing of *D. decempunctata* be compared with that of Singh's, a considerable variation is seen in the position of the tracheal pores. Takahashi realising that Singh's drawing of *decempunctata* differed essentially in this respect considered Singh's *decempunctata* was his *Dialeurodes (Dialeuropora) setigerus.* Similarly in comparing the drawing by Quaintance and Baker with that of my Malayan material, the writer considers it to be *Dialeurodes setigerus* Takahashi. It may, however, be found at some future date that *D. setigerus* Tak. is *D. decempunctata* Q. & B. Singh records the following host plants of *D. setigerus (D. decempunctata): Anona squamosa, Ficus religiosa, Dalbergia Sissoo, Morus* sp., *Prunus* sp. and *Streblus asper.*

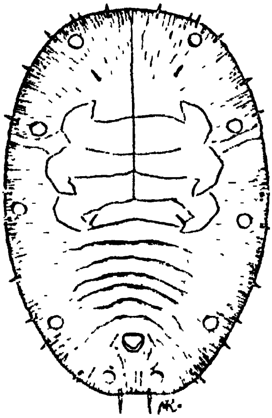

Fig. 17. *Dialeurodes setigerus* Tak.
Pupa case.

Hosts in Malaya--*Persea gratissima, Artocarpus* sp., *Peronema canescens, Cassia* sp., *Cassia alata, Colocasia* sp., *Pueraria Thunbergiana* and *Lansium domesticum.*

Localities--Sepang, Kuala Lumpur, Kajang, Dusun Tua (Selangor); Paloh and Kuala Pilah (Negri Sembilan).

Dialeurodes perseæ sp. n. (Fig. 18).

This species resembles closely *Dialeurodes setigerus* Tak. in having the twelve pairs of submarginal hastate spines, the blunt spines on the dorsum and the five pairs of large submarginal pores but differs from it essentially in the possession of a ring of small submarginal pores around the case and of similar sized pores distributed throughout the dorsum.

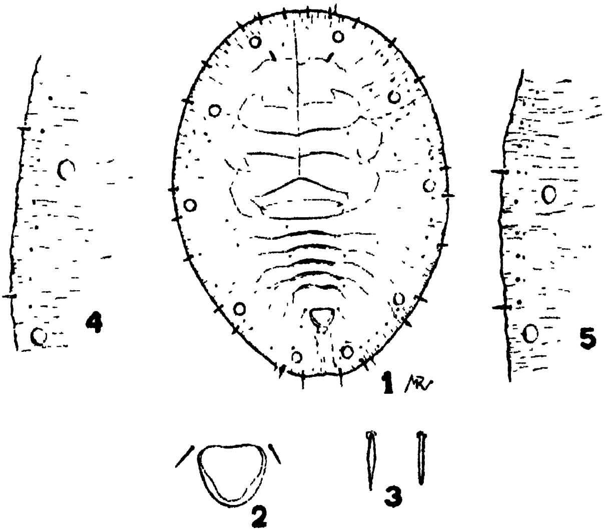

Fig. 18. *Dialeurodes perseæ* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Submarginal and cephalic spines.
4. Margin.
5. Margin of *D. centrosemæ* sp. n.

Hosts—*Persea gratissima*, *Cyamopsis psoralioides*, *Conocephalus subtrinervius* and *Musa sapientum*.

Localities—Sepang and Kuala Lumpur (Selangor).

Dialeurodes centrosemæ sp. n. (See fig. 18).

Dialeurodes centrosemæ is undoubtedly related to both *Dialeurodes setigerus* Tak. and *Dialeurodes perseæ* Corb., in the possession of twelve pairs of hastate spines and of five pairs of large pores in the submarginal but whilst a ring of small submarginal pores is present, *Dialeurodes centrosemæ* has also a ring of minute submarginal spines.

Host—*Centrosema plumieri.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes jenderus sp. n. (Fig. 19).

Pupa case on undersurface of leaf, singly and lying among bluish wax rods. Shape broadly elliptical, slightly emarginate posteriorly, margin entire, submarginal striæ moderately distinct to subdorsal area. Five pairs of submarginal pores about 0.02 mm. in diameter. No prominent submarginal spines as in *Dialeurodes setigerus* Tak.; minute setæ are, however, evident and may be seen sparsely distributed throughout the dorsum. In addition a ring of very minute submarginal pores (spines) in pairs are also present. Similar minute pores (spines) in pairs are seen on the abdomen. Tracheal pore not conspicuous but it is rounded and extrudes slightly beyond margin. Tracheal fold not discernible. Caudal fold indicated, terminating in a protuberance. Vasiform orifice subcordate, operculum almost filling orifice, slightly recessed posteriorly, lingula may be just exposed and included within or may extend beyond orifice.

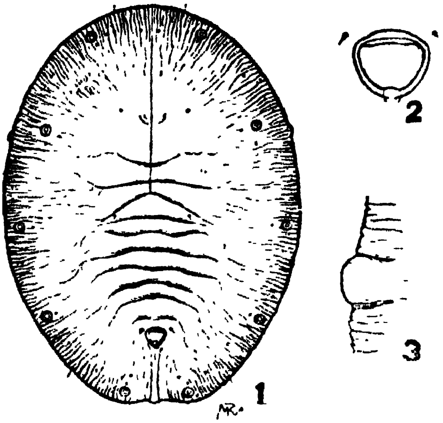

Fig. 19. *Dialeurodes jenderus* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

Length about 0.98 mm., breadth 0.76 mm.

Host—*Adinobotrys atropurpureus.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes jenderus is very similar to *D. mangiferæ* sp. n. (*infra*) but its tracheal pore is rounded whilst that of *D. mangiferæ* is toothed.

"Jenderus" is the Malay name for the host plant.

Dialeurodes mangiferæ sp. n. (Fig. 20).

Pupa case on undersurface of leaf, greyish and lying among bluish wax rods. Shape elliptical. Margin entire, striæ only moderately conspicuous in submarginal area. Five pairs of large submarginal pores about 0.027 mm. in diameter and adjacent to each is one small seta. Without prominent spines in submargin although very minute setæ are present in this area and throughout the dorsum. Tracheal pore indicated at margin by three small serrations. Tracheal fold not evident. Caudal fold only very slightly defined and at its termination the margin is finely serrate.

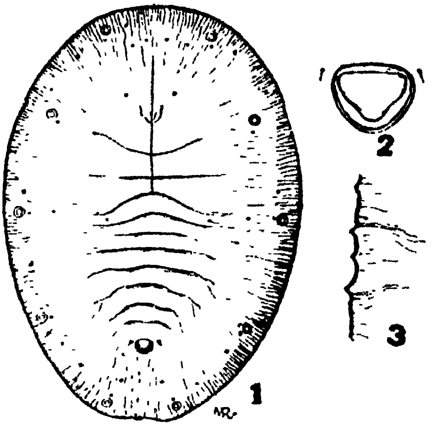

Fig. 20. *Dialeurodes mangiferæ* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

All segments fairly conspicuous. Vasiform orifice about as broad as long, without teeth: operculum similarly shaped, and fills orifice, thereby obscuring lingula.

Size, considerable variation, average length about 1.12 mm. and breadth 0.72 mm.

Host—*Mangifera indica.*

Locality—Kuala Lumpur (Selangor).

This species differs essentially from *Dialeurodes jenderus* Corb., in its possession of a toothed tracheal pore; from *D. brideliæ* Tak. in having a thoracic pore; from *D. murrayæ* Tak. in not having tubercles near the five pairs of submarginal pores and from *D. cumingum* Singh in not having a median tracheal-like ridge.

Dialeurodes langsat sp. n. (Fig. 21).

Pupa case on undersurface of leaf, stramineous, without dorsal or lateral secretion and not apparently surrounded by wax rods. Shape broadly elliptical, slightly recessed posteriorly. Marginal sutures fairly prominent. Margin has the appearance of being crenulate due to marginal sutures which extend to subdorsal area. Thoracic pore and fold not evident. Caudal fold defined but not prominent, spotted posterior to vasiform orifice and terminating in an indistinct protuberance. Without submarginal hastate spines. Five pairs of conspicuous submarginal pores but in addition a submarginal ring of small but well defined pores.

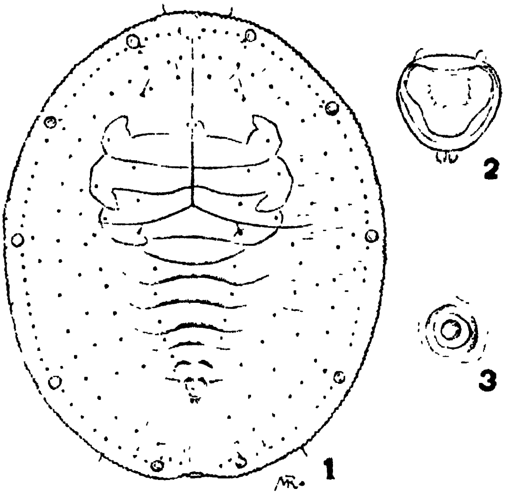

Fig. 21. *Dialeurodes langsat* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Submarginal pore.

Similar sized pores are distributed throughout the dorsum. In addition to the usual spines on anterior and posterior lateral margins, a pair of moderately prominent spines is situated on cephalo-thorax and first abdominal segment. Vasiform orifice subcordate without teeth, slightly rounded anteriorly, the operculum in some specimens almost fills the orifice obscuring lingula, in others posteriorly recessed leaving lingula exposed and included within or extruded beyond orifice.

Length 1.20 mm., breadth 0.98 mm.

Host—*Lansium domesticum.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes langsat is apparently without a tracheal pore. It is placed in the genus *Dialeurodes* on account of its close resemblance to *Dialeurodes decempunctata*, *D. murrayæ*, *D. viburni*, *D. cumingum* and other species. It may be considered advisable later on to erect a genus to include those species with five prominent pores but without submarginal spines.

"Langsat" is the Malay name for the host plant.

Dialeurodes serdangensis sp. n. (Fig. 22).

Pupa case on undersurface of leaf, whitish, without secretion. Shape elliptical. Margin entire with marginal sutures moderately defined. Tracheal pore distinct and opens just within margin, fold indicated through submargin but inconspicuous and without markings. Caudal fold narrow, anteriorly with polygonal markings and surrounded with a differentiated area. Thirteen pairs of moderately long blunt spinous processes (five pairs anterior to tracheal pore) in submargin surround the case. A pair of similar processes situated on cephalo-thorax and laterally on first abdominal segment. Throughout dorsum papilla-like structures are prominent and appear to be armed with two small spines. A pair of spines arms the caudal fold posteriorly. Vasiform orifice subcordate, inner posterior and lateral margins without teeth, outer posterior margin slightly recessed: operculum similar in shape, almost filling orifice and obscuring lingula.

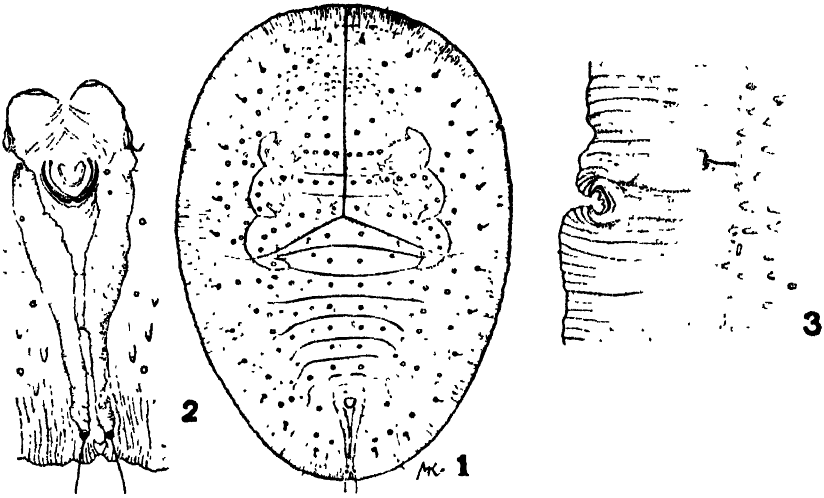

Fig. 22. *Dialeurodes serdangensis* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Submargin, tracheal pore and fold.

Length 1.16 mm., breadth 0.80 mm.

Host—*Hibiscus esculentus.*

Locality—Serdang (Selangor).

This species resembles *Dialeurodes piperis* Tak. differing essentially from it by having a submarginal ring of thirteen pairs of blunt processes.

a **Dialeurodes ara** sp. n. (Fig. 23).

Pupa case flat, closely applied to undersurface of leaf, very thin and delicate. Shape elliptical, margin almost entire, marginal sutures not prominent. Tracheal pore small and opens at margin; tracheal fold with linear markings, not reaching rudimentary legs. Caudal fold conspicuous and with linear markings. No prominent spines on dorsum but numerous small pores are present throughout the case; they are slightly larger on abdominal segments. Abdominal segments defined, sutures without corrugations. The case is without tubercles. Vasiform orifice comparatively small, cordate, without teeth on inner lateral and posterior margins, anterior margin almost straight and not chitinised. In some specimens, operculum fills about half orifice, in others nearly the whole, with posterior margin truncated: lingula generally with tip just exposed but sometimes extruded beyond orifice.

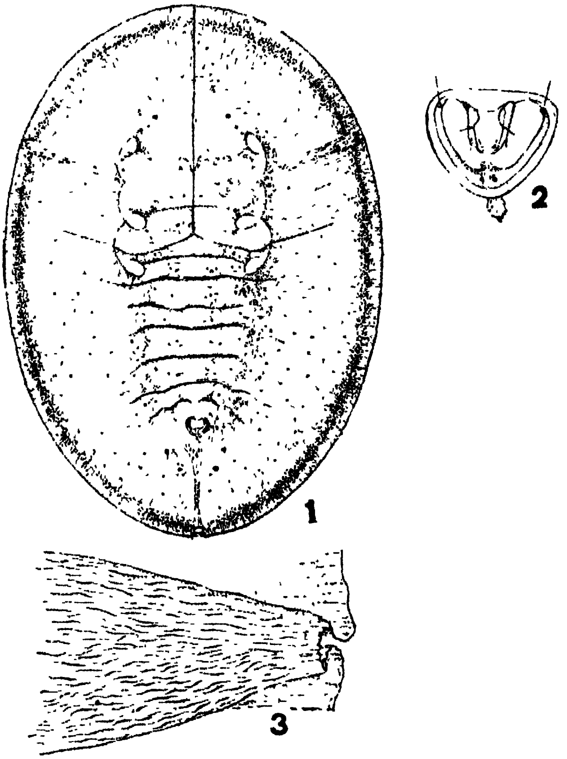

Fig. 23. *Dialeurodes ara* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

Length 1.9 mm., breadth 1.6 mm.

Host—*Ficus* sp.

Locality—Port Dickson (Negri Sembilan).

A very large species which will assist in its identification. "Ara" is the Malay name for the host plant.

Dialeurodes kepongensis sp. n. (Fig. 24).

Pupa case on leaf, flat, thin, yellowish without secretion. Shape subcircular. Margin finely crenulate, narrow marginal band evident. Tracheal fold without evident markings but clearly indicated from marginal to subdorsal area. Tracheal pore area very conspicuous, composed of about six ascomycetic-looking pores and four somewhat subrectangular porous areas. Caudal pore similar to tracheal pore. Caudal fold very narrow, without dots and not surrounded with a differentiated area. Marginal sutures moderately evident extending throughout dorsal

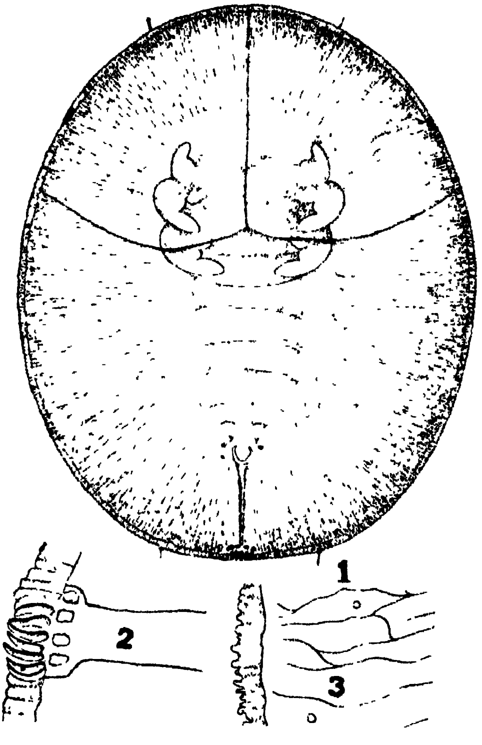

Fig. 24. *Dialeurodes kepongensis* sp. n.

1. Pupa case.
2. Tracheal pore.
3. Margin and submarginal area.

area. Minute pores (spines) are generally distributed throughout case. Abdominal segments differentiated only in mid-dorsum and sutures without thickenings. Vasiform orifice subcordate, walls thickened, operculum similar in shape and obscuring lingula.

Length 1.28 mm., breadth 1.06 mm.

Host—*Eugenia* sp.

Locality—Kepong (Selangor).

Dialeurodes evodiæ sp. n. (Fig. 25).

Pupa case closely applied to undersurface of leaf, cloudy and without secretion. Shape elliptical. Margin entire. Marginal band with a ring of small spines and similar sized spines sparsely distributed throughout dorsum. Marginal sutures prominent giving place to a marked reticulation to dorsal disc. Tracheal pore small, opens at margin, fold with linear markings and distinct to rudimentary legs. Vasiform orifice subcordate, anterior margin straight, without teeth, operculum distally truncated and lingula generally slightly exposed and included. Caudal fold immediately posterior to vasiform orifice, granulate which in turn is replaced by polygonal and linear markings.

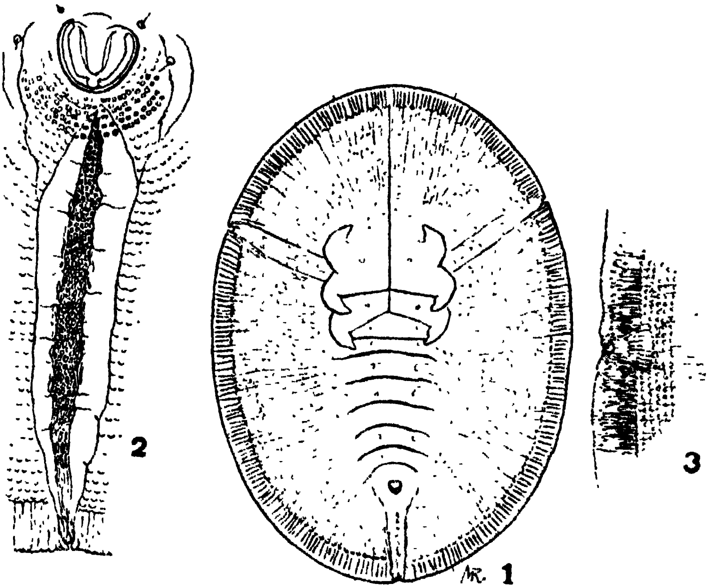

Fig. 25. *Dialeurodes evodiæ* sp. n.

1. Pupa case.
2. Vasiform orifice and caudal fold.
3. Tracheal pore.

Caudal fold and vasiform orifice surrounded with a differentiated area.

Size varies, average length about 2.03 mm., breadth 1.63 mm.

Host—*Evodia* sp.

Locality—Port Dickson (Negri Sembilan).

This species is one of the largest Aleurodids yet described.

Dialeurodes sepangensis sp. n. (Fig. 26).

Pupa case on undersurface of leaf, yellowish, without colour differentiation of median dorsal area and without dorsal or lateral secretion. Shape elliptical. Margin entire, marginal sutures extend to subdorsal area; the case in this area reticulate. Transverse suture curving anteriorly and joining thoracic suture encloses two elongate transverse areas. Thoracic suture extends to the margin. Thoracic and caudal pores armed with small teeth and situated in from the margin. The entire length of both tracheal and

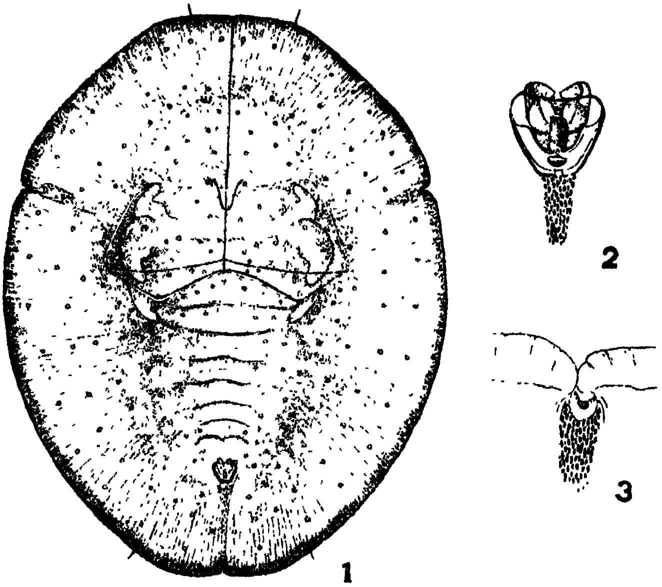

Fig. 26. *Dialeurodes sepangensis* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

caudal folds covered with dots and sculptured with polygonal markings. Abdominal segments distinct, sutures without corrugations. Case including thorax sparsely but conspicuously covered with small pores each apparently armed with a small spine. A ring of minute acicular spines, not reaching margin, may be present just within margin, but only two pairs near anterior margin are evident in the specimens. Vasiform orifice subcordate without teeth but with a projection on inner posterior margin, operculum fills about half the orifice, the lingula may just be exposed or extend to posterior margin of vasiform orifice.

Length 1.40 mm., breadth 1.10 mm.

Host—*Eugenia aquea.*

Locality—Sepang (Selangor).

D. sepangensis is similar to *D. eugeniæ* Maskll. in having the tracheal and caudal folds reticulate but differs from it in having them also spotted, in having small pores distributed throughout dorsum, and a projection from the inner posterior margin of vasiform orifice.

Dialeurodes glutæ sp. n. (Fig. 27).

Pupa case on leaf, yellowish, scale-like without secretion. Shape obovate, narrowing posteriorly. Margin very finely crenulate, marginal sutures extend into submarginal area and especially distinct near margin. Tracheal pore is a regular ring, and tracheal fold crowded with dots its whole length. Thoracic segments indicated, abdominal segments distinct. Transverse suture extends only to subdorsal area, mid-thoracic suture to margin. A ring of minute spines around case in submarginal area, about ten pairs anterior to and twenty pairs posterior to thoracic folds; similar minute spines are scattered throughout case. Case with small jointed spines, a pair on cephalo-thorax, on first abdominal segment and exterior to second pair of rudimentary legs. A pair of unjointed spines near termination of caudal fold. Near first pair and between second and third pair of rudimentary feet are groups (generally four to each) of tubercles. In some specimens, similar structures are seen subdorsally near fifth and sixth, mid-dorsally on fourth, fifth and sixth abdominal segments and on each side of caudal fold. Vasiform orifice subcordate and rounded anteriorly and posteriorly, operculum almost fills orifice obscuring lingula. Caudal fold long, wide near vasiform orifice, rest very narrow and terminating in a pore. Area around caudal fold with transversely arranged spots which are anteriorly more evident.

Length about 1.52 mm., breadth 1.20 mm.
Host—*Gluta* sp.
Locality—Puchong (Selangor).

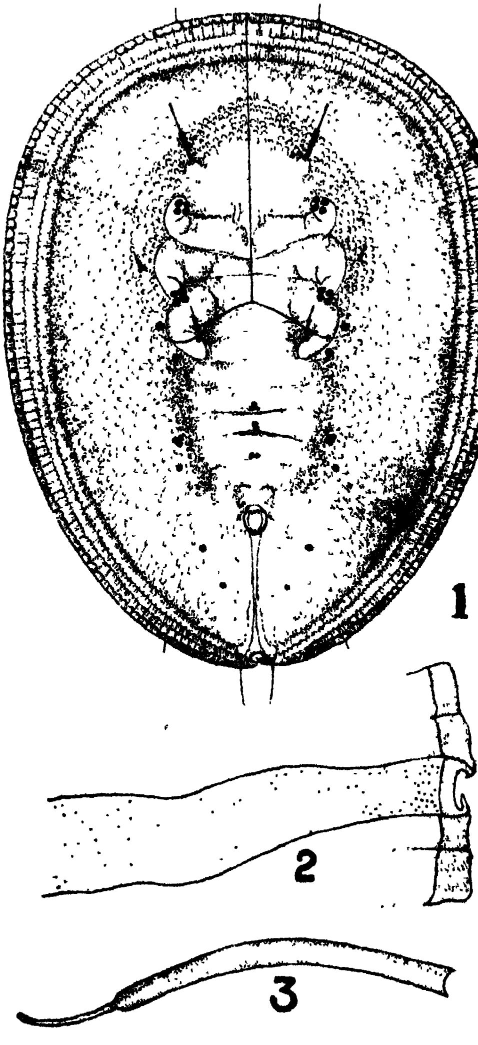

Fig. 27. *Dialeurodes glutæ* sp. n.
1. Pupa case.
2. Tracheal fold.
3. Jointed spine.

Dialeurodes striata sp. n. (Fig. 28).

Pupa case on undersurface of leaf, flat, without secretion. Shape obovate, broadest across region of third thoracic segment, narrowing posteriorly, somewhat flattened anteriorly and slightly emarginate at posterior extremity.

Margin entire, marginal band around case formed by closely set wax tubes. Conspicuous striæ, about 0.015 mm. apart, run to subdorsal area. Thoracic pore opens within margin and at margin with about five small teeth. Thoracic fold not visible. Caudal fold narrow, surrounded with a slightly differentiated area and terminates in a concavity. Transverse and mid-thoracic sutures distinct, the former reaching metathoracic legs, the latter reaching anterior margin. Thoracic and abdominal segments distinct. Tubercles near rudimentary feet prominent and at mid-dorsal line anterior to abdominal sutures chitinised structures present. A pair of setæ anteriorly on cephalo-thorax and on first abdominal segment. Vasiform orifice subcordate, without teeth on posterior or lateral margins and about as broad as long; operculum about half-fills case, recessed posteriorly; lingula exposed and reaches posterior margin of orifice.

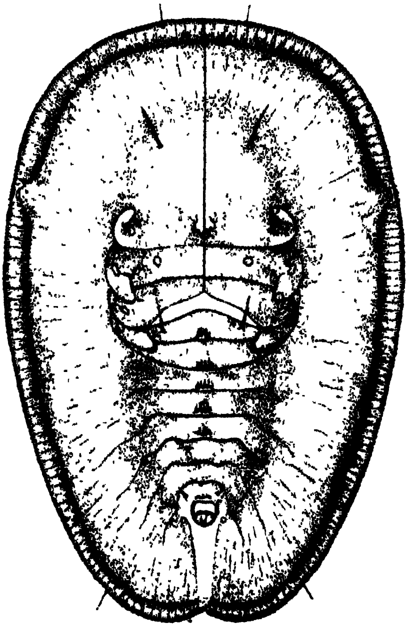

Fig. 28. *Dialeurodes striata* sp. n.
Pupa case.

Length 0.96 mm., breadth 0.74 mm.

Host—*Adinobotrys atropurpureus.*

Locality—Kuala Lumpur (Selangor).

10 **Dialeurodes gemurohensis** sp. n. (Fig. 29).

Pupa case on undersurface of leaf, not crowded together, closely applied, without dorsal or lateral secretion. Shape subovate, slightly constricted near thoracic pores and extruded at posterior margin. Margin entire, just within margin an undulate line around case. Tracheal pore cupuliform, prominent and extruded, tracheal fold not defined. Caudal pore opens within margin and fold wide and covered with dots. Transverse and thoracic sutures reach margin. Marginal sutures to subdorsal area. Abdominal and thoracic segments distinct. No tubercles define the dorsal disc but pore-like areas are prominent on mid-dorsal line of abdominal segments, anteriorly along mid-thoracic suture and first thoracic suture. The pores on the abdominal segments vary in size, the largest being near the sutures. A ring of minute pores in submarginal area and similar sized pores are regularly distributed in subdorsal area and on abdominal segments. A pair of long spines is situated anteriorly on cephalo-thorax, laterally on first abdominal segment and near termination of caudal fold. Vasiform orifice subcordate, recessed on posterior outer margin and without teeth on inner lateral and posterior margins. Operculum similarly shaped, generally filling orifice but, in some specimens about half-filling orifice leaving lingula exposed.

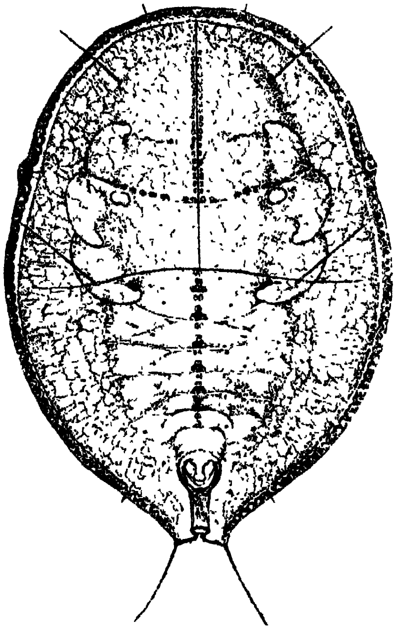

Fig. 29. *Dialeurodes gemurohensis* sp. n.
Pupa case.

Length 0.50 mm., breadth 0.39 mm.

Hosts—*Ficus* sp. and *Nephelium lappaceum*.

Localities—Kepong, Kuala Lumpur (Selangor); Gemuroh, Kuala Pilah (Negri Sembilan).

4

Dialeurodes dicksoni sp. n. (Fig. 30).

Pupa case singly, on undersurface of leaf, slightly convex and creamy white. The tubercles on periphery of dorsal disc yellowish in colour. Occasional specimens show reddish coloured spots. Both tracheal and caudal folds sometimes yellow. No lateral or dorsal secretion evident. Shape elliptical, some specimens constricted in region of thoracic folds; broadest across first abdominal segment. Margin of case finely crenulate and sutures prominent. Marginal band differentiated to a depth of about 0.03 mm. No marginal spines as in *Dialeurodes dissimilis* Q. & B. A pair of small spines at anterior and posterior lateral margins. Transverse and thoracic sutures distinct and extend to margin. A pair of long spines situated anteriorly in cephalo-thorax, on first abdominal segment and posteriorly near caudal fold. Abdominal segments defined, sutures extending into subdorsal area. Tracheal pore opens at margin, fold conspicuous and covered with minute dots. Caudal pore prominent, fold dotted. On periphery of dorsal disc, a ring of irregularly shaped tubercles, more conspicuous and more regularly arranged in abdominal area. Two tubercles generally to each abdominal segment. Vasiform orifice subcordate, inner margin armed with about thirty small teeth, posterior teeth being slightly larger; operculum constricted and almost entirely fills orifice.

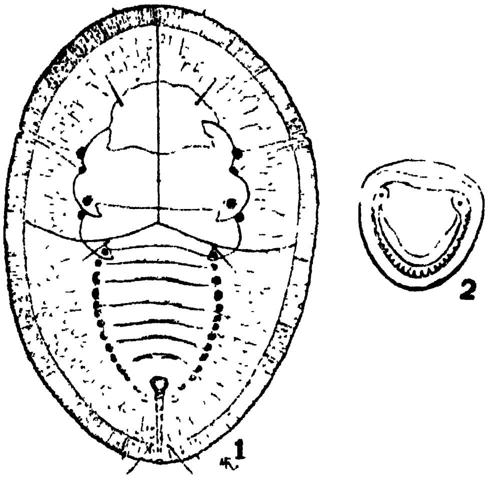

Fig. 30. *Dialeurodes dicksoni* sp. n.
1. Pupa case.
2. Vasiform orifice.

Length 0.95 mm., breadth 0.72 mm.

Hosts—*Vitex* sp., and an unidentified plant.

Localities—Kuala Lumpur (Selangor) and Port Dickson (Negri Sembilan).

(The drawing is of a specimen from the unidentified host).

Dialeurodes vitis sp. n. (Fig. 31).

Pupa case on undersurface of leaf, whitish, without dorsal or lateral secretion. Shape elongate-elliptical, narrowing posteriorly and broadest across region of second thoracic segment. Margin very finely crenulate. Thoracic pore circular, opening just within margin, fold slightly delineated without markings. Caudal fold narrow, unmarked, expanding near posterior margin, and with a differentiated area on each side. Transverse suture terminates just beyond third pair of rudimentary legs and thoracic suture which anteriorly has a wavy appearance almost reaches margin. Concentric rings of papillæ-like structures occupy the area between margin and subdorsal area of case. Each of these papilla-like structures appears to have a pore-like opening. The dorsal disc is not differentiated by tubercles but along the abdominal sutures, stout somewhat pointed tubercles are present. They are

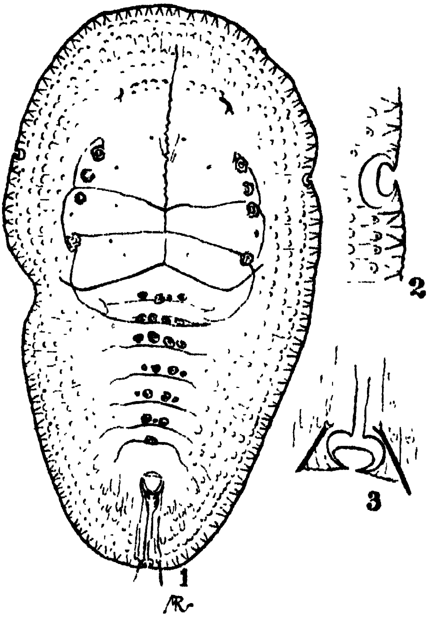

Fig. 31. *Dialeurodes vitis* sp. n.

1. Pupa case.
2. Tracheal pore.
3. Caudal pore.

not present along the thoracic sutures. There are also four pairs of large tubercles in the cephalo-thorax near the first and second pairs of rudimentary legs. A pair of spines anteriorly in cephalo-thorax and near posterior extremity of caudal fold arm case. Both pairs seem to be broken. Vasiform orifice subcordate, rounded, protruding anteriorly, cleft on outer posterior margin and not armed with teeth on inner lateral and posterior margins. The shape of the operculum in the specimen is not definite but seems to occupy the whole orifice.

Length 0.64 mm., breadth 0.40 mm.

Host—*Vitex* sp.

Locality—Kuala Lumpur (Selangor).

Dialeurodes rengas sp. n. (Fig. 32).

The appearance of the pupa case on leaf is not known. It was found among other Aleurodid material from *Gluta* sp. Shape obovate, flat anteriorly and but little recessed posteriorly. Margin entire, incised by marginal sutures, marginal band indicated. Tracheal pore a small even ring and opens at margin, the fold is only indicated in the marginal band area. Caudal pore represented by a slight concavity, the fold is unspotted, very narrow and not surrounded by a demarked area. The dorsal disc is defined

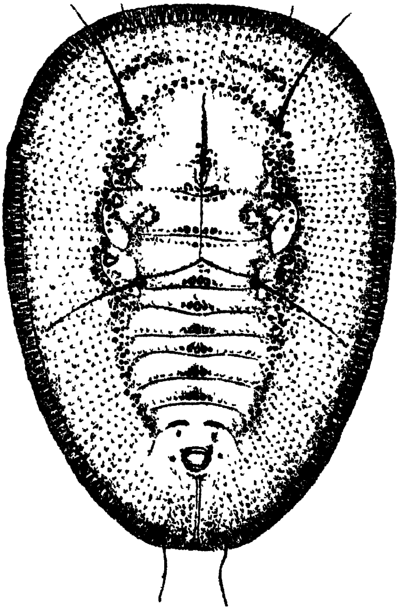

Fig. 32. *Dialeurodes rengas* sp. n.
Pupa case.

differentiated by small but numerous tubercles. A pair of small spines anteriorly on cephalo-thorax and laterally on first abdominal segment. Vasiform orifice small, subcordate and without teeth on inner posterior and lateral margins, anterior lateral margins produced and ending in a minute seta. Operculum almost fills orifice; in other specimens, about half-fills orifice, recessed posteriorly and leaving lingula just exposed.

Length 0.97 mm., breadth 0.69 mm.

Host—*Cocos nucifera.*

Locality—Batu Gajah (Perak).

This species closely resembles *Dialeurodes tuberculosa* (*infra*) but its smaller thoracic tubercles will distinguish it.

Dialeurodes tuberculosa sp. n. (Fig. 35).

The appearance of pupa case on leaf unknown. It was found when mounting other material from Cinnamon. Shape obovate, anteriorly flattened, posteriorly emarginate.

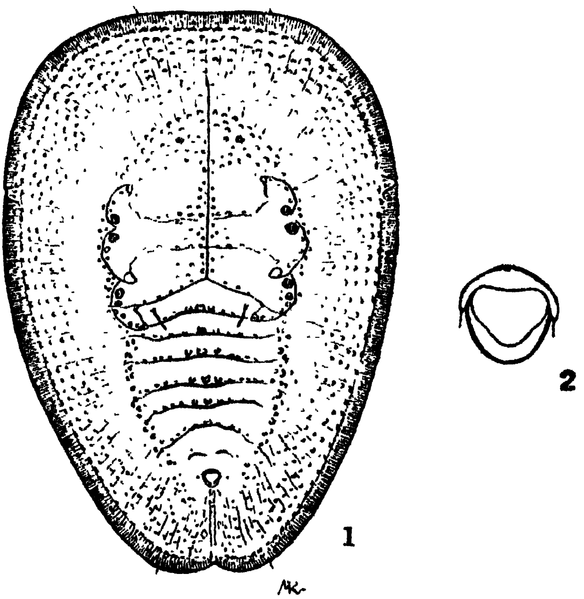

Fig. 35. *Dialeurodes tuberculosa* sp. n.
1. Pupa case.
2. Vasiform orifice.

Margin finely incised and with a pair of small setæ on anterior and posterior lateral margins: area between margin and disc without small pores but with rounded papillæ arranged in somewhat regular rings around case. Dorsal disc defined by small but conspicuous tubercles. In region of rudimentary legs some tubercles are much larger. Tracheal pore very small and opens at margin, fold merely indicated. Caudal fold narrow, indistinctly defined, unspotted and ending at margin in a concavity. In the specimen the bases of a pair of small spines on cephalo-thorax are represented and a pair on first abdominal segment is evident but there are no prominent spines at termination of caudal fold. Vasiform orifice is not particularly defined, about as broad as long and with the anterior lateral margins produced and ending in a small spine: operculum fills orifice obscuring lingula.

Length 0.82 mm., breadth 0.58 mm.

Host—*Cinnamomum* sp.

Locality—Kuala Lumpur (Selangor).

This species closely resembles *Dialeurodes simmondsi* Corb. (*supra*) from which it may be distinguished by its larger cephalo-thoracic tubercles and the absence of small pores in the area between margin and disc.

Dialeurodes razalyi sp. n. (Fig. 36).

Pupa case on undersurface of leaf, whitish transparent, singly, without dorsal or lateral secretion. Shape elliptical, broadest across first abdominal segment, narrowing posteriorly. Margin entire, marginal sutures prominent; just within margin a faintly indicated line runs around case. Tracheal pore represented by a fairly wide concavity; fold widely delineated and without markings. Caudal fold

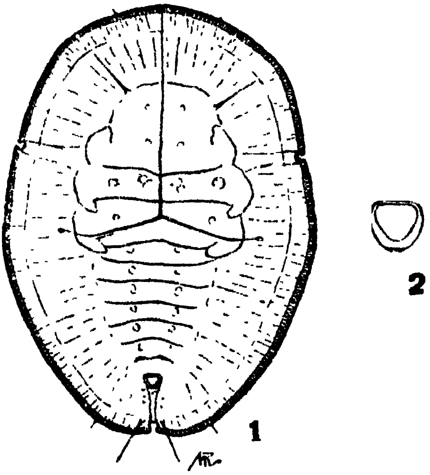

Fig. 36. *Dialeurodes razalyi* sp. n.
1. Pupa case.
2. Vasiform orifice.

broader anteriorly than posteriorly, without markings and *ending in a concavity without a mid-internal tooth. A pair of long spines is situated in cephalo-thorax and near termination of caudal fold. No subdorsal tubercles on* cephalo-thorax or abdomen. Abdominal and thoracic sutures evident without corrugations or thickenings. Thoracic suture reaches anterior margin and the transverse suture terminates in a pore-like expansion about mid-way between third pair of rudimentary legs and margin. A pair of ill-defined porous areas is indicated on the second and third thoracic segments and on the abdominal segments. No conspicuous markings are present on case. Vasiform orifice subcordate, with straight anterior margin and broadly recessed posterior margin. Operculum generally fills entire orifice and slightly constricted about its middle. Lingula obscured.

Length 0.60 mm., breadth 0.42 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species is named after Che Mohd. Razaly bin Ahmad Leun, Artist, Department of Agriculture, S.S. and F.M.S. in appreciation of his interest in this work.

Dialeurodes sandorici sp. n. (Fig. 37).

Pupa case singly, on undersurface of leaf, whitish without dorsal or lateral secretion. Shape elliptical, very slightly emarginate at tracheal pores, broadest across first abdo-

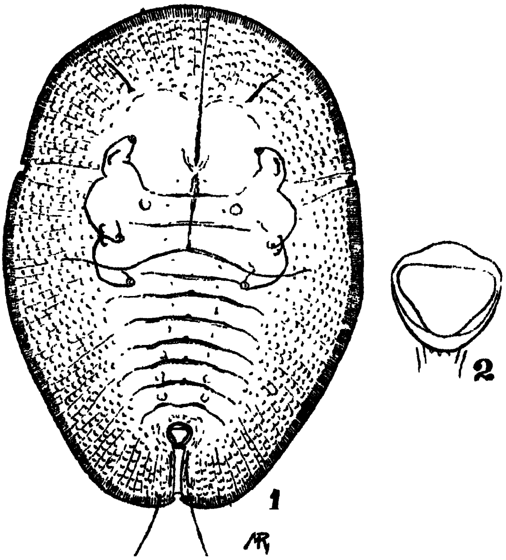

Fig. 37. *Dialeurodes sandorici* sp. n.
1. Pupa case.
2. Vasiform orifice.

minal segment. Margin entire, sutures not prominent. The area between margin and subdorsum is conspicuously covered with regular rings of crescentic markings around case. Tracheal pore wide at margin. Tracheal fold, without markings, is delineated by two ill-defined lines to rudimentary legs. Caudal opening wide, opens within margin, its fold delineated but without markings. Thoracic suture terminates at margin, transverse suture mid-way between rudimentary legs and margin. In the vicinity of first and between second and third pairs of rudimentary legs, an inconspicuous chitinised lineate tubercle is present. Thoracic and abdominal sutures define their segments and on each side of mid-dorsal line of abdomen, an interrupted crease seems to be indicated and minute tubercles are present mid-dorsally on the sutures. Two pairs of moderately strong spines arm the case, one anterior in cephalo-thorax and one near termination of caudal fold. Vasiform orifice about as broad as long, anterior margin projecting, posterior margin straight; operculum slightly constricted about its middle with posterior margin almost in contact with margin of orifice, lingula obscured.

Length 0.70 mm., breadth 0.48 mm.

Host—*Sandoricum indicum.*

Locality—Kuala Lumpur (Selangor).

Dialeurodes didymocarpi sp. n. (Fig. 38).

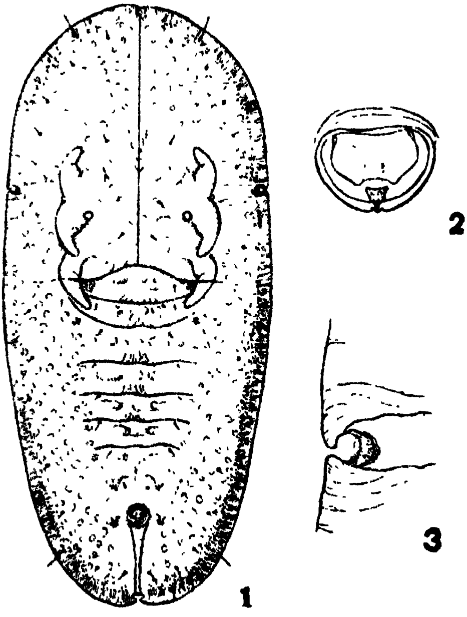

Fig. 38. ***Dialeurodes didymocarpi*** **sp. n.**
1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

Pupa case on undersurface of leaf, singly, delicate, yellowish, no secretion. Shape elongate-elliptical. Margin entire, striations at margin not prominent. Thoracic pore opens within margin and adjacent to it a semicircular porous area is present. The tracheal fold delineated and without markings. The caudal fold is irregular in outline, conspicuous, unmarked and terminates within the margin. In submarginal area a ring of small spines surround the case. Abdominal segments moderately distinct, each with a pair of minute spines. Dorsum covered with numerous subcircular porous looking areas; some appear to be armed with a pair of minute spines. Vasiform orifice rather broader than long, without teeth, and with posterior outer margin slightly recessed: operculum sub-rectangular, posteriorly recessed, fills about two-thirds of orifice leaving tip of lingula exposed and included within orifice.

Length 0.94 mm., breadth 0.47 mm.

Host—*Didymocarpus crinita.*

Locality—Serdang (Selangor).

Dialeurodes hibisci (Kotinsky). (Fig. 39).

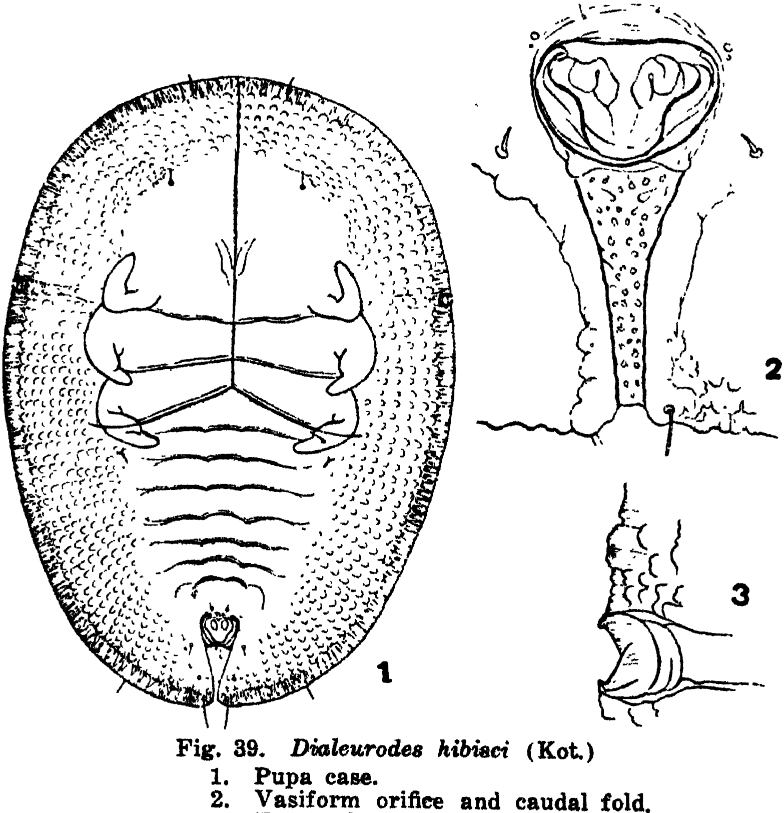

Fig. 39. ***Dialeurodes hibisci*** **(Kot.)**

1. **Pupa case.**
2. **Vasiform orifice and caudal fold.**
3. **Tracheal pore.**

Aleyrodes hibisci Kotinsky, Board Comm. Agr. Forest, Hawaii, Bull. 2, p. 96, (1907).

Dialeurodes fletcheri Singh. Mem. Dept. Agric. Ind., Ent. Ser. XII, p. 29, (1931).

Dialeurodes (*Singhius*) *hibisci* Kotinsky, Aleyrodidæ of Formosa, I, p. 14 (R. Takahashi).

Takahashi records this species from Formosa on *Salix* sp., *Sapium sebiferum, Machilus* sp., *Celtis sinensis, Glochidion hongkongense, Cinnamomum camphora, Bridelia* sp., *Macaranga tanarius, Jasminum* sp., *Hibiscus rosa-sinensis*; and Singh from Pusa on *Breynia rhamnoides.*

Hosts in Malaya—*Ipomœa Batatas, Hibiscus Rosa-sinensis, Ficus elastica* and *Baccaurea Motleyana.*

Localities—Port Dickson, Johol (Negri Sembilan); Serdang (Selangor).

The length of the spines varies in different specimens, representatives on *Hibiscus Rosa-sinensis* having very minute spines. Karam Singh figures *Dialeurodes fletcheri*, possibly a synonym of *Dialeurodes hibisci* as suggested by Takahashi, with long spines on cephalo-thorax and first abdominal segment. Specimens in Malaya from *Ficus elastica* and *Baccaurea Motleyana* have long spines similar to those shown by Singh.

Dialeurodes angulata sp. n. (Fig. 40).

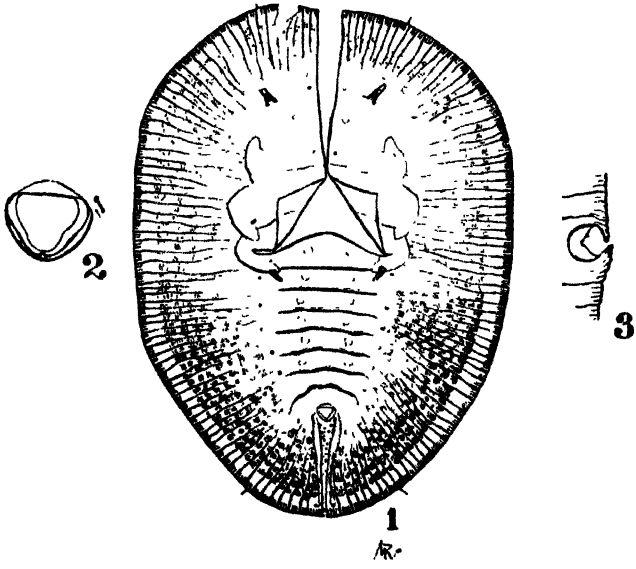

Fig. 40. *Dialeurodes angulata* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal pore.

Pupa case on undersurface of leaf, singly, whitish without dorsal or lateral secretion. Shape elliptical, somewhat angular at thoracic pores and across region of fifth abdominal segment, narrowing posteriorly. Margin entire incised by sutures, about four between each pair of prominent sutures which extend to subdorsum. Tracheal pore small, opening at margin, without teeth and with inner margin thickened. Tracheal fold not discernible. Caudal pore similar to tracheal pore, the fold with irregularly-shaped markings and surrounded with a delineated area. First six abdominal segments with a pair of ill-defined chitinised structures, otherwise not conspicuously sculptured, the sutures are prominent to subdorsal area. Case without conspicuous tubercles subdorsally, but with two pairs of large tubercles, one on cephalo-thorax and one on first abdominal segment. (These are probably the bases of spines). The transverse suture extends only to metathoracic legs, the mid-thoracic to margin. A ring of minute spines about 0.1 mm. from margin surround case. Vasiform orifice cordate, without teeth, with anterior margin protruding and with a small tooth from inner posterior margin. Operculum straight anteriorly, constricted at its middle and rounded posteriorly. Lingula obscured.

Length 1.20 mm., breadth 0.88 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species has been described from one specimen but the prominent sutures from margin are distinctive.

Dialeurodes doveri sp. n. (Fig. 41).

Pupa case flat, inconspicuous, on undersurface of leaf, without dorsal or lateral secretion. Shape elliptical, slightly pointed anteriorly and emarginate at thoracic pores. Margin finely crenulate interrupted by small papillæ. Thoracic pore extruded beyond margin, rounded and rendered evident by the absence of crenulations. Tracheal fold without markings and indistinctly delineated to rudimentary legs. Caudal fold, without markings, broadly delineated and ending in a slight concavity where margin is chitinised and without crenulations. Abdominal and thoracic sutures evident but without thickenings or tubercles. Mid-thoracic suture to margin, transverse to just beyond rudimentary leg and appears to terminate in a small pore. No prominent papillæ or tubercles on abdomen or cephalo-thorax but small pores are sparsely distributed between margin and subdorsal area of case. A pair of similar sized pores is present submedially on each abdominal segment. A pair of spines, represented by their bases, anteriorly on cephalo-thorax and a pair just within posterior margin arm the case. Vasiform orifice subcordate, anterior margin straight and posterior margin broadly rounded, the operculum almost fills orifice, narrows just beyond middle with its posterior margin truncated. In some specimens, the tip of an incised lingula may be seen.

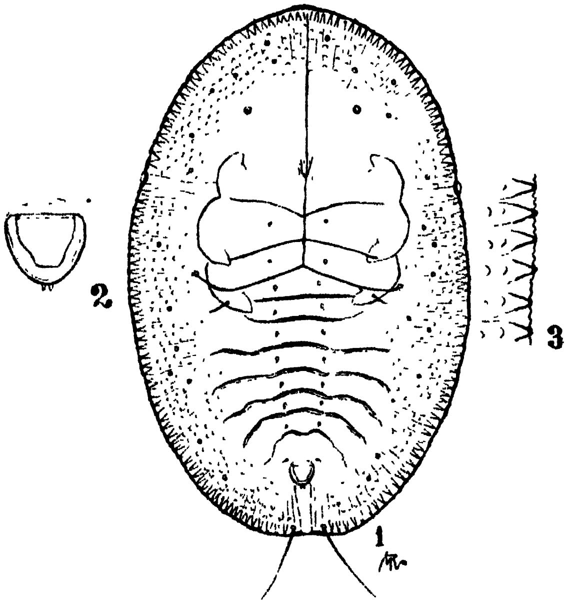

Fig. 41. *Dialeurodes doveri* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Margin.

Length 0.70 mm., breadth 0.46 mm.

Host—*Musa sapientum.*

Localities—Dusun Tua and Kuala Lumpur (Selangor).

This species is named after Mr. Cedric Dover who collected it on October 27th, 1927, when he was entomologically engaged in Malaya.

Dialeurodes musæ sp. n. (Fig. 42).

The appearance of pupa case on leaf unknown. This species is described from one specimen but most characters are so well-defined that little difficulty should be encountered in identifying it. Shape elliptical, pointed anteriorly, slightly emarginate in region of thoracic pores and recessed posteriorly. Margin very finely crenulate, marginal striæ conspicuous to subdorsal area. Tracheal pore indicated by absence of crenulations. Tracheal fold may be traced to rudimentary legs, spots or other markings absent. Mid-thoracic suture to margin, transverse to about subdorsal area. A pair of long flagelliform spines is present on cephalo-thorax and at termination of caudal fold; another similar pair of spines which are only represented by their bases may be present on first abdominal segment.

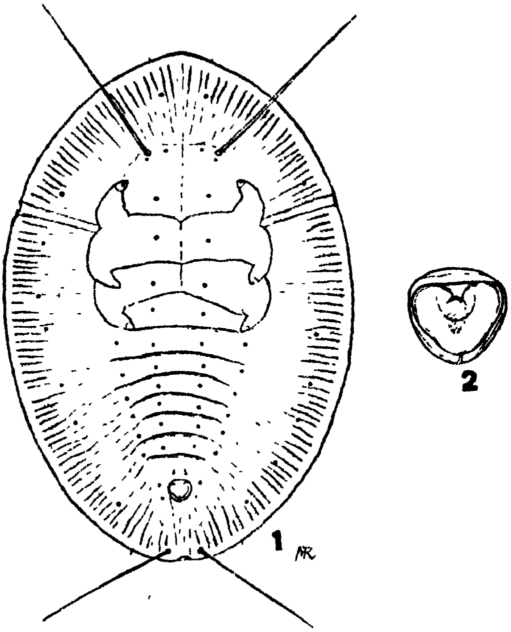

Fig. 42. *Dialeurodes musæ* sp. n.

1. Pupa case.
2. Vasiform orifice.

Caudal fold wide anteriorly, narrowing posteriorly and ending in a marginal concavity. A ring of small but conspicuous circular pores about 0.07 mm. from margin is present in submarginal area; similar sized pores are seen submedially on the abdominal and thoracic segments and subdorsally on the abdominal segments. Vasiform orifice about as broad as long with posterior wall divided and without teeth on inner lateral or posterior margins. Operculum constricted slightly about the middle, fills orifice and obscures lingula.

Length 0.84 mm., breadth 0.58 mm.

Host—*Musa sapientum.*

Locality—Dusun Tua (Selangor).

Dialeurodes joholensis sp. n. (Fig. 43).

Pupa case singly on undersurface of leaf, yellowish, without dorsal or lateral secretion. Shape elliptical, deeply recessed posteriorly, margin incised by a large number of fine sutures extending a short distance into submarginal area. Tracheal pores open at margin, folds indistinct.

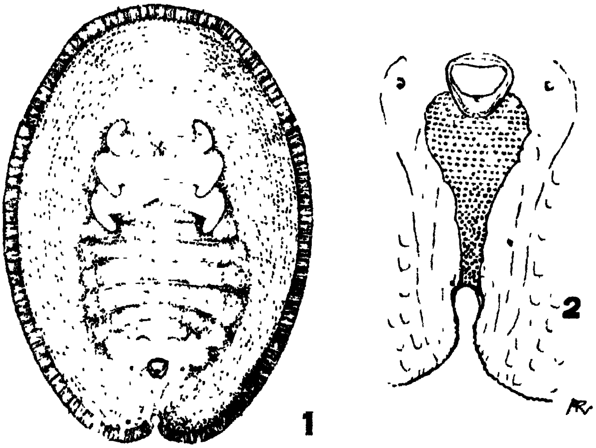

Fig. 43. *Dialeurodes joholensis* sp. n.

1. Pupa case.
2. Vasiform orifice.

Caudal fold pyriform, expanding on both sides of vasiform orifice and conspicuously covered with granules arranged anteriorly in transverse regular rows. A pair of small spines on anterior and on posterior lateral margins are present. Just within the slightly differentiated marginal area, a ring of about sixty very minute spines is present. Abdominal segments distinct. Vasiform orifice subcordate, outer posterior margin recessed, inner posterior and lateral margins without teeth; operculum about half fills orifice and tip of lingula exposed.

Length about 1.00 mm., breadth 0.74 mm.

Host—Unidentified plant.

Localities—Johol (Negri Sembilan), Kuala Lumpur (Selangor).

The shape of the caudal fold and the markedly recessed posterior margin of case are distinctive features of this species.

Dialeurodes pilahensis sp. n. (Fig. 44).

The appearance of pupa case on leaf unknown. Shape subovate, slightly depressed at thoracic and caudal pores.

Margin conspicuously toothed, with a distinct suture between each pair of teeth. These sutures dividing give the periphery of dorsal disc a distinctly reticulated appearance; reticulations larger in cephalo-thorax and almost absent on abdominal segments. Transverse and mid-thoracic sutures terminate at margin. Thoracic and caudal pores armed on each side by a slightly larger tooth than those of the margin. Tracheal fold faintly indicated; caudal fold, narrow, dotted anteriorly and lined posteriorly.

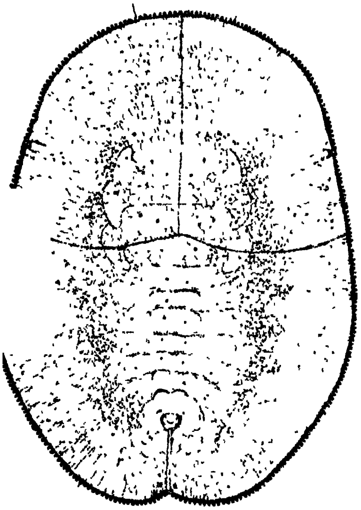

Fig. 44. *Dialeurodes pilahensis* sp. n.
Pupa case.

Thoracic and abdominal sutures distinct, without thickenings. Dorsum sparsely covered with small spines, two or three pairs to each thoracic and abdominal segment. Vasiform orifice subcordate, about as broad as long with outer posterior margin recessed, operculum almost fills orifice.

Length 1.12 mm., breadth 0.88 mm.

Host—*Eugenia aquea.*

Locality—Kuala Pilah (Negri Sembilan).

Dialeurodes pilahensis has been described from one specimen found whilst mounting other Aleurodids from *Eugenia aquea.*

Dialeurodes crescentata sp. n. (Fig. 45).

Pupa case on undersurface of leaf, yellowish, without dorsal or lateral secretion. Shape elliptical, not emarginate near thoracic pores, broadest across first abdominal segment. Margin entire, marginal sutures present forming a marginal band. Thoracic pore opens narrowly at margin, thickened internally; thoracic fold is only slightly delineated in some specimens. Caudal fold wide anteriorly, narrows about mid-way and terminates at margin in a wide opening. Area between margin and dorsal disc with crescentic markings which subdorsally give place to small irregularly shaped tubercles. Abdominal segments distinct with corrugations and their sutures with small tubercles. The dorsum is not armed with conspicuous spines; a small pair is indicated anteriorly in cephalo-thorax but a prominent pair at the termination of caudal fold is absent. Vasiform orifice sub-cordate, operculum similarly shaped, fills orifice and obscures lingula. In some specimens, operculum about half fills orifice, recessed posteriorly and tip of lingula exposed but included within orifice.

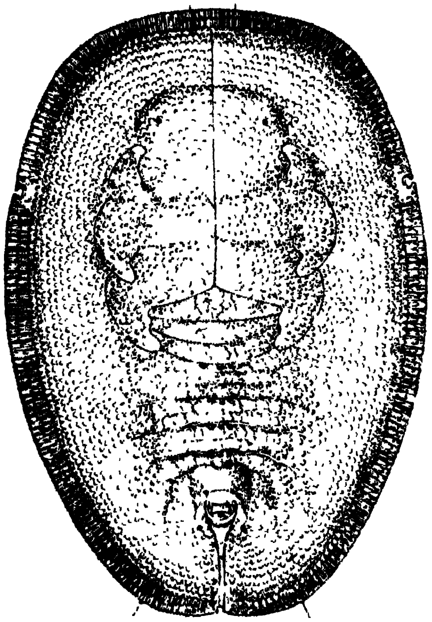

Fig. 45. *Dialeurodes crescentata* sp. n.

Pupa case.

Length 0.68 mm., breadth 0.54 mm.

Host—*Cinnamomum* sp.

Locality—Kuala Lumpur (Selangor).

The shape of the case, tubercles around dorsal disc and absence of a caudal pair of spines will distinguish this species from *D. sandorici* Corb. (page 770).

Dialeurodes dubia sp. n. (Fig. 46).

Pupa case on undersurface of leaf, thin in texture, whitish with a slight covering of white wax. Shape broadly elliptical. Margin has a crenulate appearance due to the marginal sutures which are fairly evident to the dorsal disc. Without tracheal pores or folds but in two specimens a slight indication of a caudal furrow is evident. Minute spines are sparsely scattered throughout the dorsum and a ring of small blunt spines about 0.08 mm. from margin surround the case. The abdominal segments are defined by conspicuous sutures, a pair of very minute spines may be seen on each abdominal segment. The vasiform orifice is subcircular with prominent teeth on both lateral and posterior margins and from inner posterior margin a blunt projection arises. The shape of the operculum varies; in some specimens it narrows posteriorly and obscures the lingula, in others, it is rectangular, recessed posteriorly and exposes the tip of the lingula.

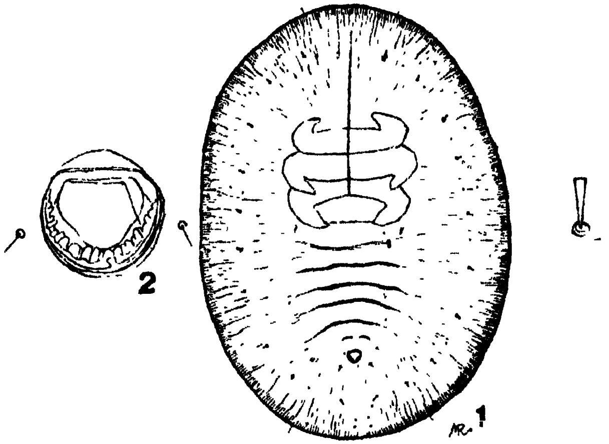

Fig. 46. *Dialeurodes dubia* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. A submarginal spine.

Length 1.56 mm., breadth 1.20 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species is not a typical *Dialeurodes*. Its vasiform orifice in shape and in possession of teeth suggests a species closely related to those included in the genus *Dialeurodes*.

Genus **Aleuroplatus** Quaintance and Baker.

U.S. Dept. Agric., Tech. Series, No. 27, Part II, p. 98.

Aleuroplatus mammæferus Quaintance & Baker. (Fig. 47).

Proceedings of the United States National Museum, Vol. 51, p. 400, 1917.

This species was described by Quaintance and Baker from material taken in 1911 by R. S. Woglum on *Codiæum variegatum* at the Botanical Gardens, Buitenzorg, Java. The writer's material was collected at Sepang and Kuala Lumpur on "Croton," frequently referred to in Malaya as "Pokok Teh" from the leaf's appearance to that of tea. The plant is not a croton but *Codiæum variegatum.* In Insects of Samoa, Part II, 1927, Laing described *Aleuroplatus (Orchamus) samoanus.* His material was obtained from Upolu Island, Apia, from the leaves of cultivated Croton. Subsequently, Dozier in the Journal of Agricultural Research, Vol. 36, No. 12, 1928, considered after examining abundant pupa case material on leaves of citron (*Citrus medica*) from Marquesas Islands, that *Aleuroplatus samoanus* Laing was different in certain characters from *Aleuroplatus mammæferus* Q. & B. The writer considers his material closely resembles *Aleuroplatus mammæferus* Q. & B. It may be mentioned that Laing's material was collected from cultivated croton and Quaintance and Baker's and my material from *Codiæum*

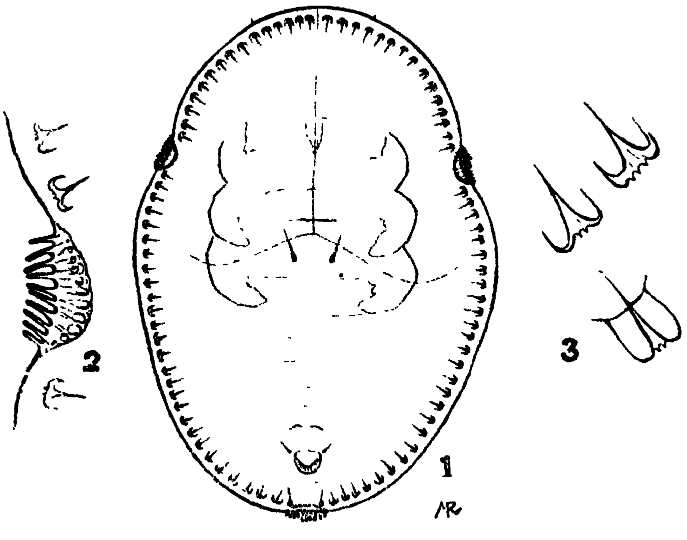

Fig. 47. *Aleuroplatus mammæferus* Q. & Bkr.

1. Pupa case.
2. Tracheal pore.
3. Marginal papillæ.

variegatum, the name of the plant which is generally termed " Croton " in Malaya.

Host in Malaya—*Codiæum variegatum.*

Localities—Kuala Lumpur and Sepang (Selangor).

Aleuroplatus joholensis sp. n. (Fig. 48).

Pupa case on undersurface of leaf, frequently in numbers, black, surrounded with gelatinous yellowish secretion remaining soft for some months. Shape subovate, pointed anteriorly, slightly constricted at thoracic pore and recessed at posterior margin. Margin toothed with a pair of small spines on anterior and posterior lateral margins. Cephalothoracic ridge prominent. Thoracic and caudal pores with about five prominent teeth, rounded, distinct, widely separated and projecting beyond marginal teeth. Thoracic suture reaching margin, transverse to margin. Abdominal segments not well defined, sutures slightly chitinised. Minute pores are numerous throughout the dorsum, a ring just within margin surrounding the case is conspicuous.

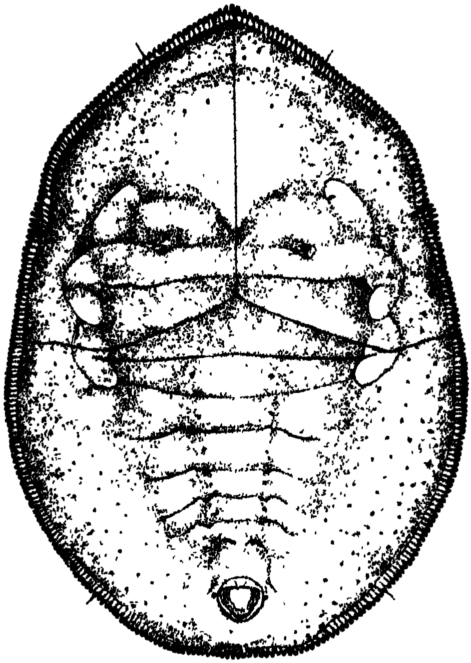

Fig. 48. *Aleuroplatus joholensis* sp. n.
Pupa case.

A pair of similar pores is situated on each abdominal segment. Vasiform orifice subcordate, with minute teeth on lateral and posterior inner margins and with a projection mid-posteriorly from inner margin, outer posterior margin slightly recessed, operculum truncated, generally filling about two-thirds of orifice but obscuring lingula.

Length about 0.69 mm., breadth 0.50 mm.

Host—*Dillenia* sp.

Locality—Johol (Negri Sembilan).

Genus **Bemisia** Quaintance and Baker.

U.S. Dept. Agric., Tech. Series, No. 27, Part II, p. 99.

Bemisia gossypiperda Misra and Karam Singh Lamba. (Fig. 49).

The Cotton White Fly (*Bemisia gossypiperda*), Bulletin No. 196, Agricultural Research Institute, Pusa, 1929.

Bemisia achyranthes Karam Singh, Memoirs of the Dept. Agric. in India, Vol. ~~XX~~ X'', No. 1, p. 82, 1931.

Karam Singh states that *B. gossypiperda* and *B. achyranthes* have seven pairs of long spines, a pair in front and a pair behind the eyes, two sublateral pairs on the thorax, one submedial pair on first abdominal segment, one sublateral pair on abdomen and a pair cephalad of the orifice but that *B. gossypiperda* M. & K.S. differs from *B. achyranthes* in the possession of papilliform markings, absence of dotted folds and details of vasiform orifice. Many host plants are recorded for *B. gossypiperda* but he records only one,

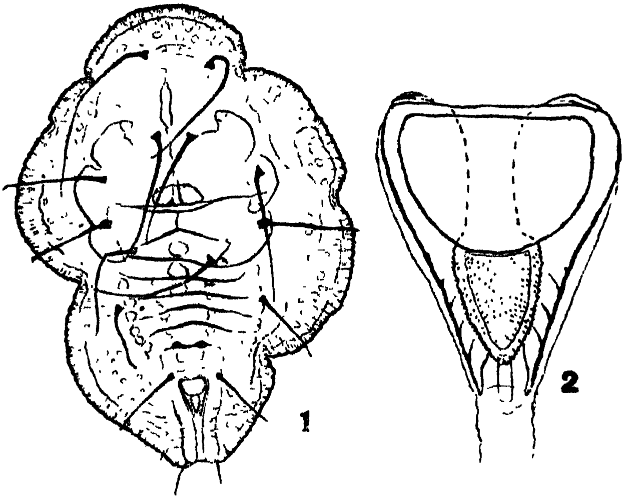

Fig. 49. *Bemisia gossypiperda* Misra & K. Singh.
1. Pupa case.
2. Vasiform orifice.

viz:—Achyranthes aspera—a host plant also of *B. gossypiperda*—for *B. achyranthes*. The writer is of the opinion that both these species are the same, *viz:—Bemisia gossypiperda* M. & K.S., since material from the same plant shows that the number of spines and papillæ-like markings varies, that subdorsal abdominal tubercles may or may not be present and that dots on the thoracic folds may be entirely absent, just indicated or numerous. For instance, in a series collected from *Clerodendron villosum*, specimens have five to seven pairs of spines, generally one of the sublateral pairs on the thorax and the sublateral pair on the abdomen are absent, the tracheal spots marked, indicated or absent, at least one medial papilla-like marking on the abdominal segment; but in most representations there is one on first and second abdominal segment and in some a medial papilla-like marking is present on the first five abdominal segments. In addition, subdorsal tubercles on the abdomen may or may not be present. I have unfortunately not examined material of *Bemisia gossypiperda* M. & K.S. but in view of the fact that my material is from several host plants (the same as *B. gossypiperda*), that all have at least one mid-abdominal tubercle and that most have tracheal dots, I am of the opinion that *B. gossypiperda* and *B. achyranthes* are the same species and that the material in my collection is *B. gossypiperda* M. & K.S.

Hosts in Malaya—*Clerodendron villosum, Solanum melongena, Trichosanthes anguina, Ageratum conyzoides, Cucurbita Pepo, Chrysanthemum sinense* and *Dolichos lablab*.

Localities—Senaling, K. Lumpur, Serdang (Selangor) and Sungkai (Perak).

Bemisia artocarpi sp. n. (Fig. 50).

Pupa on undersurface of leaf, white, without secretion. Shape elliptical, slightly depressed at thoracic tooth and at posterior margin. Margin with thickened rim and with sixteen well developed spines each arising from a tubercle. Between the fifth and sixth spines but nearer the sixth is one prominent tooth, the tracheal pore. The fold is not defined. Caudal fold distinct, with large sculptures, narrowing posteriorly and terminating in about eight inconspicuous teeth. A ring of small pores around case just within margin is also present. Transverse suture reaching the margin and dividing the case approximately into two halves. A series of pits is situated subdorsally on thorax and abdomen, three pairs near mouth parts, two pairs posterior to first thoracic suture followed by another pair posterior to second thoracic suture, a pair posterior to transverse suture and a pair posterior to each of the following five abdominal segments. Vasiform orifice somewhat rectangular, projecting anteriorly and narrowing posteriorly, operculum fills about two-thirds of orifice, lingula knobbed and may be included within or partly excluded beyond orifice.

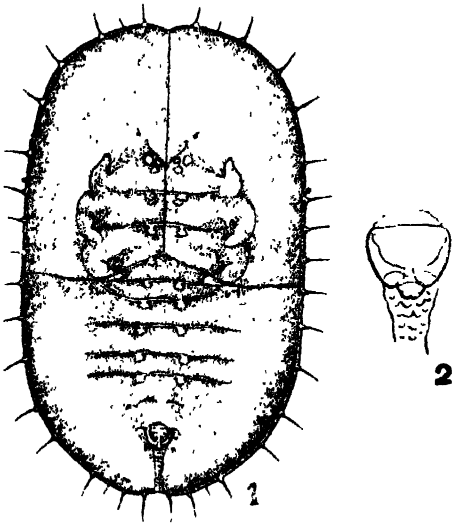

Fig. 50. *Bemisia artocarpi* sp. n.
1. Pupa case.
2. Vasiform orifice.

Length 0.85 mm., breadth 0.55 mm.

Host—*Artocarpus* sp.

Locality—Pudu, Kuala Lumpur (Selangor).

This species closely resembles *Bemisia kuwanai* Tak. from which it may be distinguished readily by the shape of the lingula, in its possession of sixteen pairs of marginal spines, and in having a larger number of pairs of pits on cephalo-thorax.

I am not satisfied that *Bemisia artocarpi* is a true *Bemisia.* It has been placed in this genus on account of its similarity to *B. kuwanai* Tak.

Bemisia giffardi (Kotinsky).

Aleyrodes giffardi Kot., Div. Ent. Bd. Com. 'Agr. and Forestry, Hawaii, Bull. No. 2, p. 94, 1907.

Bemisia giffardi Kot., Annotationes Zoologicæ Japonenses, Vol. II, No. 3, No. 1, 1927, Kuwana.

This species was first found in Hawaii on Citrus plants and described by Kotinsky in 1907. It has since been recorded on Citrus in Japan and India and is represented in my collection by material (No. 48) collected by Mr. C. P. Clausen in April, 1930, on Citrus from Java, Singapore and Kuala Lumpur.

Bemisia myricæ Kuwana.

Bemisia myricæ Kuw., Annotationes Zoologicæ, Japonenses, Vol. II, No. 3, p. 249, 1927.

Kuwana records this species on leaves of *Myrica rubra, Morus alba* and *Citrus* spp. from Japan. The representatives in my collection were obtained by Mr. C. P. Clausen on Citrus (No. 49) from Java and Singapore in October, 1929 and by the writer from *Gardenia florida* Kuala Lumpur.

Bemisia porteri sp. n. (Fig. 51).

Pupa case elliptical, broadest across thoracic pores, slightly emarginate at posterior margin. Margin entire, marginal sutures fairly distinct. Thoracic and caudal pores ending in eight to nine small teeth. Tracheal fold conspicuously dotted. Caudal furrow very narrow, and surrounding area sparsely covered with dots. Abdominal segments defined. Subdorsum with a ring of small spines. Vasiform orifice triangular and elongate: operculum subcordate filling about one-third of orifice; lingula long,

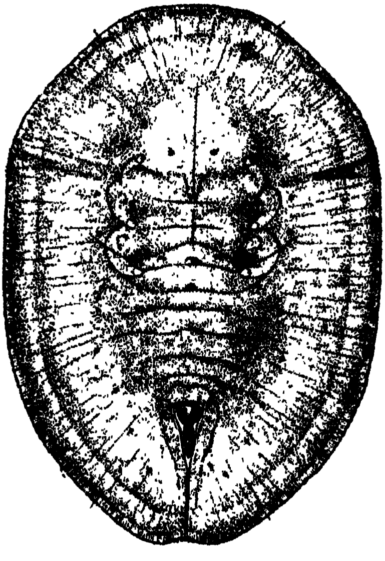

Fig. 51. *Bemisia porteri* sp. n.
Pupa case.

pointed, armed with a pair of spines and included within orifice.

Host—*Quisqualis indica.*

Locality—Kuala Lumpur (Selangor).

This species which has been described from one specimen found among other Aleurodid material on *Quisqualis indica* is related in its possession of tracheal teeth to the genus *Asterochiton*, but in the shape of its vasiform orifice to the genus *Bemisia*. *Bemisia porteri* is named after Mr. W. J. Porter, lately Telephone Traffic Manager, S.S. and F.M.S., in whose garden the writer collected the material.

Bemisia goldingi Corb.

Ann. Mag. Nat. Hist., (X), Vol. 16, Aug. 1935, p. 249.

The type material was collected on cotton by Mr. F. M. Golding, Ibadan, Nigeria. This species is closely related to *Bemisia hibisci* Tak. differing from it essentially in having small pores around the case in the submargin and sparsely distributed throughout dorsum.

Hosts—*Hibiscus Rosa-sinensis, Hibiscus esculentus, Gossypium herbaceum.*

Locality—Kuala Lumpur (Selangor).

Bemisia spp.

In my Aleurodid collection eight different lots of *Bemisia* sp. (without dorsal spines) from *Manihot utilissima* are represented. Some are subovate with a wide dotted tracheal fold, blunt tubercles on some of the abdominal segments and a ring of small submarginal pores, others are elliptical with indications of a dotted tracheal fold, prominent subdorsal papillæ and abdominal blunt tubercles, an ill-defined fold around dorsal disc and without a prominent ring of submarginal pores, whilst others have some of these characters but others are wanting. Representatives in the same lot are so varied that they may well be considered at some future date *Bemisia goldingi* Corbett. My Malayan collection also contains a species of *Bemisia* on *Zinnia* sp., *Brassica oleracea*, *Salvia* sp., *Amaranthus* sp., *Helianthus annus*, *Clerodendron fragrans*, *Impatiens balsamina*, *Psidium guajava*, *Cassia* sp., *Colocasia* sp., *Musa sapientum*, *Glycine soja*, *Centrosema plumieri*, *Calopogonium mucunoides*, *Canavalia turgida*, *Capsicum annuum*, *Viola odorata* and *Dahlia coccinea* but none possesses definite distinctive characters enabling its separation. It seems very probable that all are the same species and that breeding will be necessary to decide if they are all the same or represent several species.

Genus **Aleurocybotus** Quaintance and Baker.

U.S. Dept. Agriculture, Tech. Series, No. 27, 1914.

Aleurocybotus setiferus Quaintance and Baker. (Fig. 52).

Proceedings of the United States National Museum, No. 2156, p. 357, 1917.

This species was received by Quaintance and Baker in 1907 from Java on *Imperata* sp. and in 1913 from Peradeniya, Ceylon, on a grass. The writer also recorded this species in 1926 on *Imperata arundinacea* from Peradeniya.

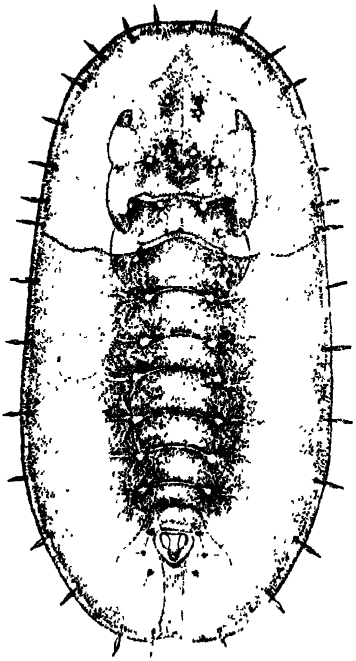

Fig. 52. ***Aleurocybotus setiferus*** **Q. & Bkr.**
Pupa case.

Host in Malaya—*Imperata arundinacea.*

Locality—Kuala Lumpur (Selangor).

Genus **Aleurocanthus** Quaintance and Baker.

U.S. Dept. Agr., Tech. Ser. 27, pt. II, p. 102, 1914.

Aleurocanthus gateri Corb. (Fig. 53).

Malayan Agricultural Journal, Volume XV, p. 23, 1927.

Aleurocanthus gateri is readily distinguished from other species of *Aleurocanthus* by the five pairs of very long spines—two on the thorax and three on the abdomen.

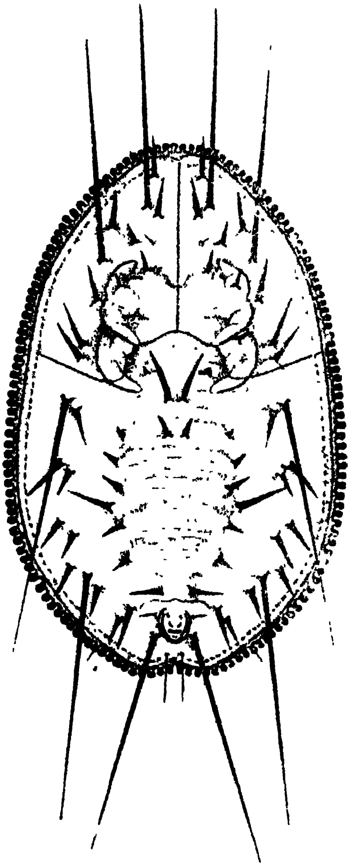

Fig. 53. *Aleurocanthus gateri* Corb.
Pupa case.

Hosts—*Cocos nucifera* and *Elæis guineensis.*

Localities—Batu Gajah (Perak), Setapak, Kuala Selangor, Sepang, Pudu and Kuala Lumpur (Selangor).

Aleurocanthus cocois Corb. (Fig. 54).

Malayan Agricultural Journal, Volume XV, p. 23, 1927.

Host—*Cocos nucifera.*

Locality—Batu Gajah (Perak).

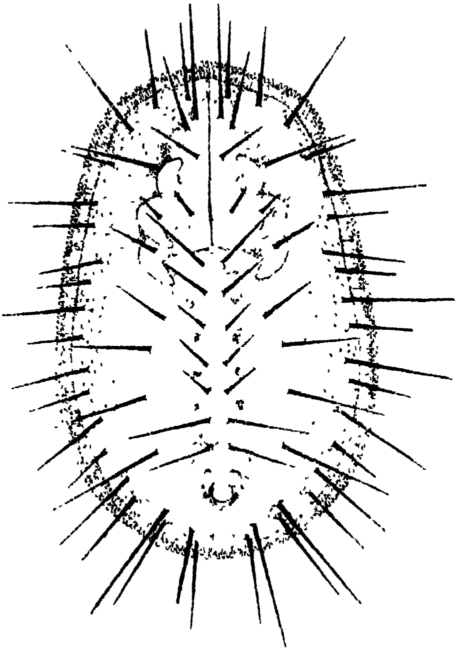

Fig. 54. *Aleurocanthus cocois* Corb.

Pupa case.

This species is similar to *Aleurocanthus canangæ* sp. n. (*infra*) but *Aleurocanthus cocois* is armed with longer spines.

Aleurocanthus canangæ sp. n. (Fig. 55).

Pupa case on undersurface of leaf, crowded together, light brown with a marked white wax fringe extending laterally on the leaf and also to subdorsal area of case. Shape subovate, broadest about the region of third abdominal segment. Margin dentate, nine teeth occupy a space of 0.1 mm. Suture separating the thorax and abdomen distinct. Subcircular pore-like markings around case between margin and bases of submarginal spines. Dorsum with numerous spines arranged in a similar manner to but shorter than those of *Aleurocanthus cocois* Corb. Submarginal area with a more or less even row of eighteen pairs of spines, the shorter alternating with the slightly longer spines, the shorter about 0.12 mm. in length, the longer 0.16 mm. (*A. cocois* has twenty pairs of submarginal spines and the shorter average 0.20 mm. in length and the longer 0.27 mm.). In the area between bases of the submarginal spines and margin, there is a ring of fine setæ, the apices about reaching margin.

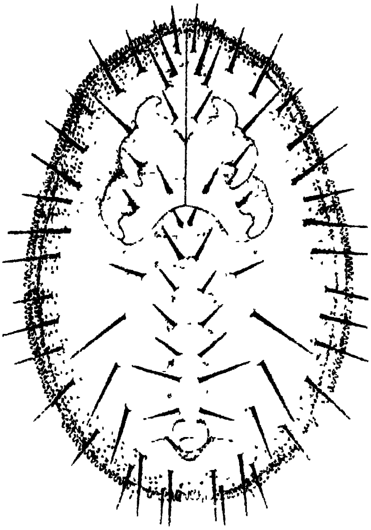

Fig. 55. *Aleurocanthus canangæ* sp. n.
Pupa case.

Near median line of abdomen and anterior to vasiform orifice there are seven pairs of spines, the sixth posterior pair being the longest. In subdorsal abdominal area, four pairs, first pair about 0.12 mm. second, third and fourth posterior pairs about 0.18 mm. in length. On median line of cephalo-thorax there are four pairs of spines, the most posterior pair being very short and situated near transverse suture. In addition there are three pairs near rudimentary feet, a pair of fine setæ situated laterally to vasiform orifice and another pair near margin, posterior to vasiform orifice. Vasiform orifice subcordate, operculum similar in shape, obscuring lingula.

Length about 1.12 mm., breadth about 0.80 mm.

Host—*Cananga odorata.*

Locality—Kuala Lumpur (Selangor).

Aleurocanthus canangæ and *A. cocois* are very similar in the arrangement of their spines but in *A. cocois* Corb. the spines are longer.

Aleurocanthus yusopei sp. n. (Fig. 56).

Pupa case on undersurface of leaf in groups, without conspicuous dorsal and lateral secretion, black to brownish black. Shape obovate, slightly emarginate at anterior lateral margin and rounded at both anterior and posterior margins. Margin dentate with about eleven teeth to 0.1 mm. About 0.09 mm. from the margin, a ring of suture-like markings runs around the case (this ring is not evident in all specimens). Just within this ring, eight pairs of spines are arranged, the most anterior, the third and seventh pairs being considerably longer in length.

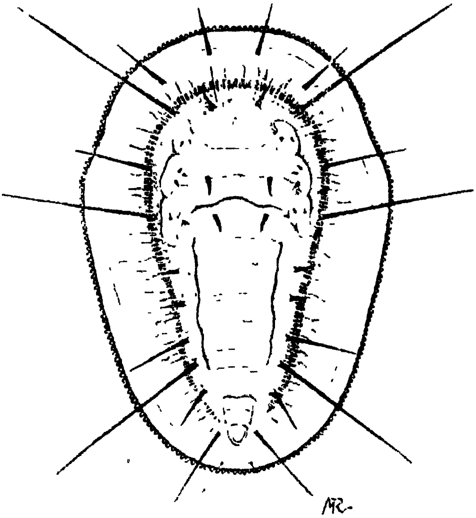

Fig. 56. *Aleurocanthus yusopei* sp. n.
Pupa case.

In addition to these spines, there are two pairs near anterior margin and two shorter pairs subdorsally in cephalo-thorax, a pair of short spines posterior to transverse suture and a long pair near vasiform orifice. A pair of setæ anterior to vasiform orifice and at posterior margin may also be seen. Vasiform orifice is subcordate, slightly protruding anteriorly, the operculum is constricted at its middle and obscures lingula.

Length 0.66 mm., breadth 0.46 mm.

Host—*Cocos nucifera.*

Locality—Kuala Lumpur (Selangor).

Named after Che' Mohamed Yusope, Malay Agricultural Assistant, who collected it from a coconut palm near the Mosque, Kuala Lumpur.

Aleurocanthus longispinus Quaintance and Baker. (Fig. 57).

Proceedings of the U.S. National Museum, No. 2156, p. 344, 1917.

Pupa case on leaf black, with the spines dark brown, surrounded with a white waxy fringe. Shape elliptical. Margin dentate, about eight teeth occupying 0.1 mm. On submarginal area, about 0.14 mm. from margin, a ring of about one hundred and twelve conspicuous spines, extending beyond margin and varying in length. Other spines are present on the dorsum, some of which are indicated in the figure. Vasiform orifice on a tubercle and its inner margin in some specimens is irregularly waved or toothed. Operculum generally entirely fills orifice, obscuring lingula but sometimes exposed, its termination expanding into a disc, the anterior edge being set with hairs.

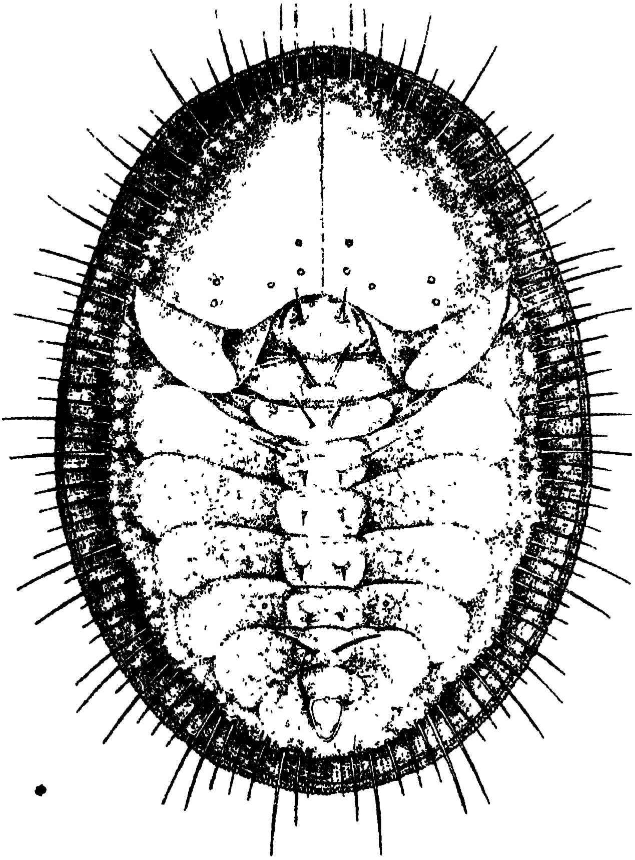

Fig. 57. *Aleurocanthus longispinus* Q. & Bkr.
Pupa case.

Length 1.53 mm., breadth 1.24 mm.

The details of the pupa cases of *Aleurocanthus longispinus* Q. & B. in my collection are not distinct and some characters have been taken from Quaintance and Baker's and Karam Singh's description of the species.

This species was originally described from material collected on bamboo at Calcutta and Burma in 1910. Karam Singh records it from *Bambusa arundinacea* at Pusa.

Host in Malaya—*Bambusa* sp.

Locality—Kuala Pilah (Negri Sembilan).

Aleurocanthus lumpurensis sp. n. (Fig. 58).

Pupa case in groups on undersurface of leaf, convex, black and with very slight white marginal secretion. Shape elliptical. Margin toothed with about eleven teeth to 0.1 mm. Just within the margin a ring of tooth-like projections is prominent, and mid-way between margin and the ring of spines is a ring of elliptically-shaped bodies. About 0.83 mm. from margin, a conspicuous ring of about thirty-six pairs of spines, varying in length, runs around the case. In addition to this ring, four pairs of spines on cephalo-thorax and ten pairs on the abdomen as illustrated may be seen. Both the thoracic and transverse sutures reach margin, the

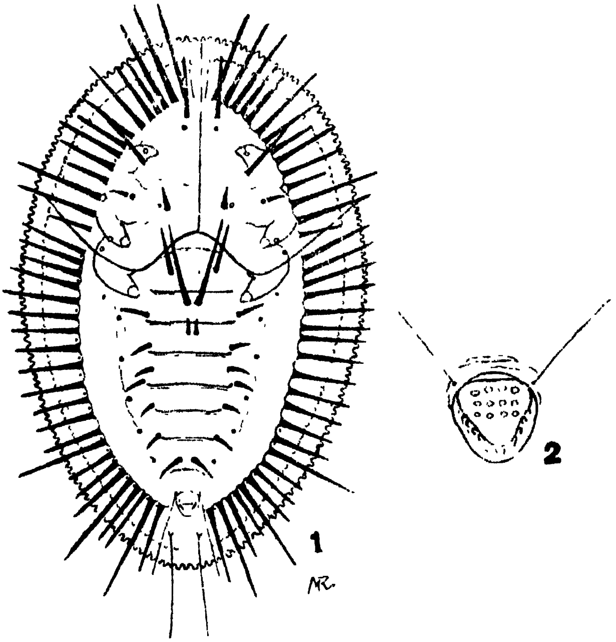

Fig. 58. ***Aleurocanthus lumpurensis* sp. n.**

1. **Pupa case.**
2. **Vasiform orifice.**

latter at first turns posteriorly and then anteriorly. Vasiform orifice is subcordate slightly protruding anteriorly; the operculum generally occupies about two-thirds of orifice and has twelve small pore-like bodies on its surface. The lingula is obscured.

Length 0.70 mm., breadth 0.42 mm.

Host—*Bambusa* sp.

Locality—Kuala Lumpur (Selangor).

In general appearance *A. lumpurensis* is similar to *A. longispinus* but the former has seventy-six and the latter one hundred and ten spines in the ring surrounding the case.

Aleurocanthus pendleburyi sp. n. (Fig. 59).

Pupa case congregated on undersurface of leaf, some specimens dense black, others yellowish-brown, marginal white waxy secretion conspicuous and appears to raise case from leaf. Shape convex, subovate. Margin serrate, eight serratulate teeth occupying 0.1 mm. Transverse and thoracic sutures distinct, both reaching margin. The submarginal area with a ring of fine setæ, their apices about reaching margin, with three or four rings of small capitate spines and with fifteen pairs of long spines,

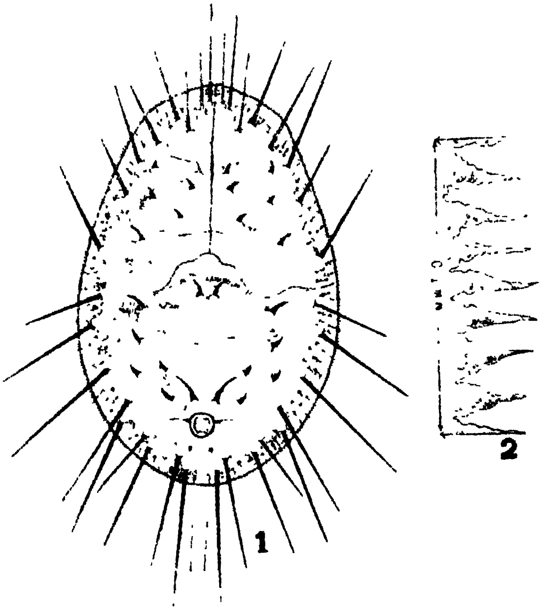

Fig. 59. *Aleurocanthus pendleburyi* sp. n.
1. Pupa case.
2. Marginal serratulate teeth.

about 0.25 mm. in length. In addition, anteriorly in the cephalo-thorax, two other similar pairs are prominent. The dorsum has several pairs of short robust spines arranged as follows:—on cephalo-thorax, three pairs subdorsally and three pairs submedially; on abdomen, three pairs subdorsally, two pairs posteriorly and submedially and two pairs in median line, one anteriorly and one anterior to vasiform orifice. All these spines remain black at the tips after considerable boiling. A pair of fine setæ anteriorly in cephalo-thorax, on tubercle of vasiform orifice and near posterior margin. Vasiform orifice subcordate and elevated on a tubercle about 0.19 mm. in length, operculum similar in shape, almost filling orifice.

Length 0.96 mm., breadth 0.65 mm.

Host—*Eugenia* sp.

Locality—Pahang.

This species is named after Capt. H. M. Pendlebury, Systematic Entomologist and Curator, Selangor Museum, who forwarded the material to the writer for identification.

Aleurocanthus woglumi Ashby. (Fig. 60).

Aleurocanthus woglumi Ashby. Journal of Agricultural Research, Vol. VI, No. 12, Dept. Agric., Washington, D.C. 1916.

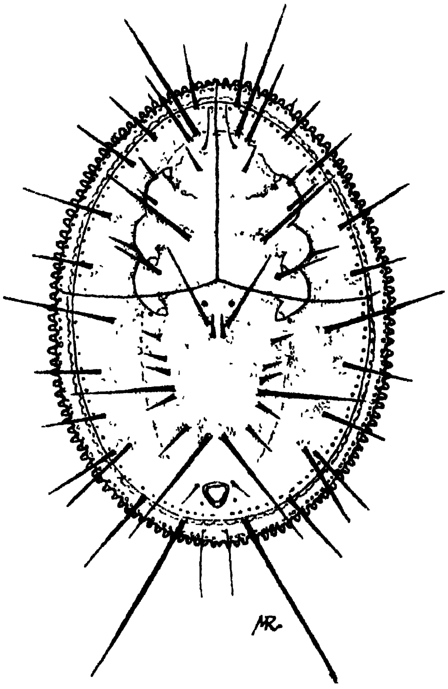

Fig. 60. *Aleurocanthus woglumi* Ashby.
Pupa case (from *Citrus acida*).

In the writer's collection, *Aleurocanthus woglumi* Ashby is represented by material (Quaintance and Baker, No. 6564) collected by R. S. Woglum from *Citrus* sp. in India. These representatives have 4—4½ marginal teeth occupying 0.1 mm., a ring of small pores around case about 0.078 mm. from margin and five submarginal spines posterior to transverse suture on each side of the case. The Malayan representatives which I have considered to be *A. woglumi* show a variation between five to seven pairs of submarginal spines posterior to the transverse suture but in other respects, such as the arrangement, length and number of dorsal spines, are so similar to the description and drawing by Quaintance and Baker that no character has been found to permit them to be differentiated from *A. woglumi.*

The species is widely distributed having been found in Cuba, Jamaica, Bahamas, Ceylon, India and the Philippine Islands, and in addition to *Citrus* spp. has been recorded from *Capparis roxburghi, Capparis pedunculosus, Morus* sp., *Salacia reticulata, Kurrimia zeylanica, Guaiacum officinale, Cestrum nocturnum* and *Cocos nucifera.*

Hosts in Malaya—*Citrus acida, Citrus aurantium, Citrus limonum, Coffea arabica, Plumeria acutifolia, Loranthus* sp. and *Adinobotrys atropurpureus.*

Localities—Serdang, Kuala Lumpur (Selangor), Malacca and Singapore.

Aleurocanthus spiniferus (Quaintance).

Aleurodes spinifera Quaintance, Can. Ent., Vol. 35, p. 63, 1903.

Aleurocanthus spiniferus Quaintance, "A Contribution to Our Knowledge of the Sub-family Aleyrodidæ," Proceedings of the U.S. National Museum, Volume 51, 1917.

Aleurocanthus rosæ Singh. Mem. Dept. Agr. India Ent. Ser. XII ~~XIII~~, 1931.

This species was originally described by Quaintance from material collected by C. L. Marlatt on *Citrus* sp. and *Rosa* sp. in Java. It has since been recorded on *Salix warburgi, Sloanea dasycarpa, Fagara nitida and Liquidambar formosana* (Takahashi).

Hosts in Malaya—*Rosa* sp. and *Citrus* sp.

Localities—Kuala Lumpur (Selangor) and Kuala Pilah (Negri Sembilan).

My specimens from *Rosa* sp. show six pairs of submarginal spines posterior to transverse suture, all arising at different places. Some representatives, however, from *Citrus* sp. show seven pairs, the fourth and fifth pairs being close together.

Aleurocanthus spiniferus (Quaintance) is distinguished from *Aleurocanthus hibisci* sp. n. (*infra*) by having the anteriorly situated cephalic spines shorter.

Aleurocanthus hibisci sp. n. (Fig. 61).

Pupa case on leaf, crowded together, convex, shiny black, with a white fringe. Shape elliptical to ovate. Margin serrate, 8½ teeth to 0.1 mm. A ring, about 0.5 mm. from margin, of rounded processes, about four to 0.1 mm., runs around case. Dorsum with well-developed spines arranged as follows:—on submarginal area, a more or less even ring of twelve pairs, about 0.24 mm. in length, extending well beyond margin, the ninth and tenth pairs in close proximity, on cephalo-thorax eight pairs, the two most anterior being the longest, and on the abdomen anteriorly in median line, three pairs and posteriorly one pair and subdorsally six pairs, the fourth pair being

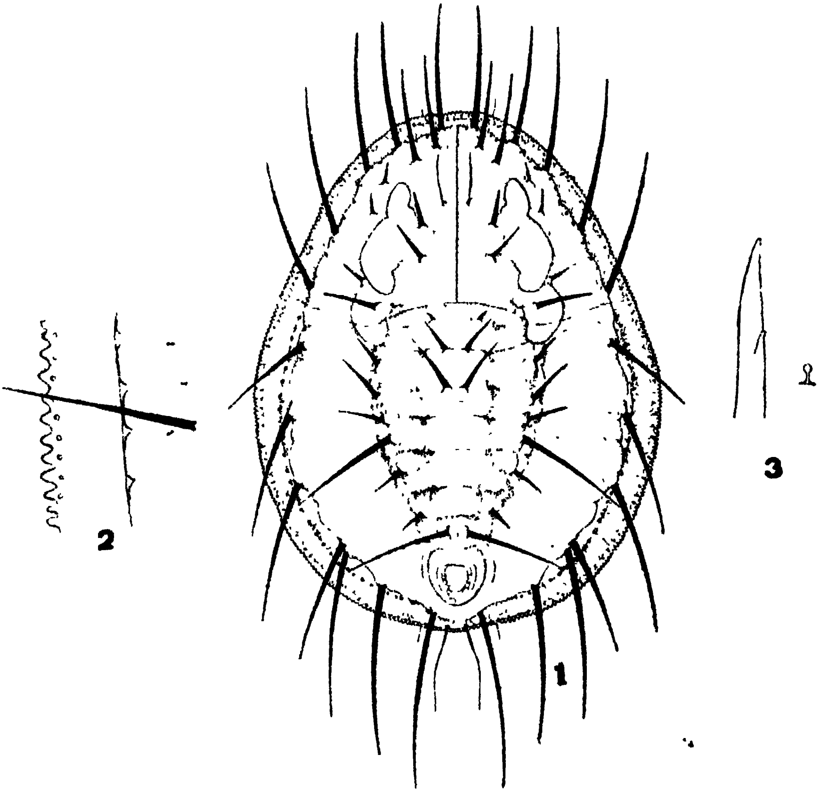

Fig. 61. *Aleurocanthus hibisci* sp. n.
1. Pupa case.
2. Margin and submargin.
3. Marginal and capitate spines.

the longest. In addition, a pair of fine setæ anteriorly on cephalo-thorax and near posterior margin are present. The submarginal spines are notched. A ring of small capitate spines between the processes and submarginal spines, and of small pores just within the margin are evident. Vasiform orifice on a tubercle, subcordate and inner margins armed with about eight prominent teeth; operculum similar in shape obscuring lingula.

Length about 1.0 mm. and breadth 0.72 mm.

Hosts—*Hibiscus Rosa-sinensis* and *Hibiscus tiliaceus.*

Localities—Kuala Lumpur and Sepang (Selangor).

Aleurocanthus hibisci is similar to *A. spiniferus* (Quaint.) the latter species, however, although having seven pairs of spines posterior to transverse suture, the fifth and sixth, and not the fourth and fifth, pairs arise in close proximity. In *Aleurocanthus hibisci* the spines anteriorly in the cephalo-thorax extend beyond the margin, in *A. spiniferus* they are much shorter and do not reach the anterior margin.

Aleurocanthus cameroni sp. n. (Fig. 62).

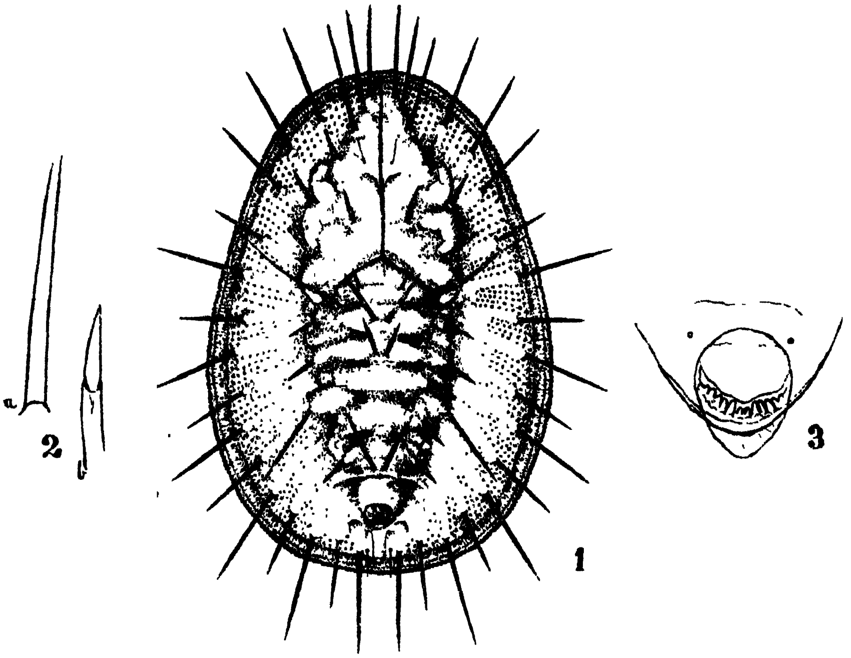

Fig. 62. *Aleurocanthus cameroni* sp. n.
1. Pupa case.
2a. Marginal spine.
2b. Apex of marginal spine.
3. Vasiform orifice.

Pupa case shining, black, without dorsal secretion but with a somewhat flocculent white lateral fringe. Shape subovate broadest across third abdominal segment. Margin dentate, teeth fine and acute, about 7½ occupying 0.1 mm. Just within margin a ring of very minute pores surround case. Submarginal area with a ring of elliptically shaped porous looking bodies, about four occupying 0.1 mm. and with small capitate spines. Transverse and thoracic sutures distinct to margin. Dorsum faintly corrugated and in partially cleared specimens brownish pigmented spots are evident. Dorsum armed with thirty-six spines extending beyond margin and posterior to transverse suture are in two series, the longer series arising nearer the margin than the shorter one. The apex of a submarginal spine appears as a separate joint from the basal portion. Medio-dorsal line of abdomen with four pairs of spines, first pair immediately anterior to vasiform orifice, others on first three abdominal segments. The pair on first abdominal segment shorter and more separated than the other two pairs; the pair on second abdominal segment the longest. Six pairs of spines are present on periphery of abdominal segments, five pairs short and about equal in length, fourth pair longest. Three pairs of short spines are present on subdorsal area of thorax and another short pair near its medio-dorsal line. In addition a pair of slender setæ is present anteriorly on cephalo-thorax. The details of the vasiform orifice are obscure but apparently subcordate. It is armed with about eleven rounded teeth on posterior and lateral margins, operculum similar in shape fills about two-thirds of orifice and obscures the lingula.

Length 1.25 mm., breadth 0.97 mm.

Hosts—*Citrus acida*, *Citrus aurantium*, *Citrus limonum* and *Citrus hystrix*.

Localities—Batu Gajah, Tapah (Perak), Serdang, Kuala Lumpur (Selangor), Kuala Pilah (Negri Sembilan), Cameron Highlands (Pahang) and other places.

Aleurocanthus cameroni is generally distributed throughout Malaya on Citrus plants. It is very similar to *Aleurocanthus citriperdus* Q. & B. but may readily be distinguished from it by having on the cephalo-thorax seven pairs of spines extending beyond the margin. It is also related to *Aleurocanthus spiniferus* but whereas this species may have six or seven pairs of submarginal spines posterior to the transverse suture, *A. cameroni* has *eleven* pairs. It is also similar to *Aleurocanthus cinnamoni* Tak. but in this species some of its submarginal abdominal spines are close together whilst in *A. cameroni* all are separated.

Genus Aleurotrachelus Q. and B.

U.S. Dept. Agric., Technical Series, No. 27, Part II, 1914.

Aleurotrachelus selangorensis sp. n. (Fig. 63).

Pupa case on undersurface of leaf, singly, yellowish, shining, without dorsal or lateral secretion. Abdominal ridge prominent. Shape elongate-elliptical. Margin double row of teeth, outer teeth longer than wide, inner teeth more rounded. Abdominal ridge prominent but not produced

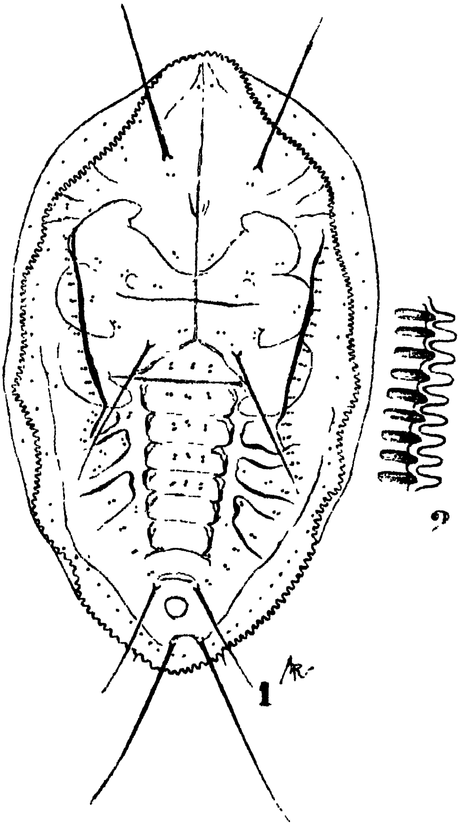

Fig. 63. *Aleurotrachelus selangorensis* sp. n.
1. Pupa case.
3. Margin.

anteriorly to a marked arrow-shaped structure. Pigmented spots not seen but simple small pores in irregular rows in the area between margin and disc are conspicuous. In addition to these small pores, pores of a similar size in pairs run externally along lateral folds and extend into the abdomen. Similar pores in pairs may also be seen in cephalo-thorax, the first five abdominal segments have three pairs of small pores in pairs. The dorsum is armed with four pairs of long spines (the usual second pair on cephalo-thorax in this species seems to be unrepresented). The details of the vasiform orifice are not clearly defined; it appears to be subcircular in outline.

Hosts—*Diospyros* sp., and an unidentified plant.

Locality—Kuala Lumpur (Selangor).

Aleurotrachelus anonæ sp. n. (Fig. 64).

Pupa case singly on undersurface of leaf, yellowish, no secretion. Shape elliptical, rounded anteriorly and posteriorly. Double row of teeth, outer row dentate, inner row smaller, more rounded and not clearly defined. Transverse and thoracic sutures distinct: the former reaching thoracic folds and the latter the anterior margin. Running external to and near narrow thoracic fold, a line of pairs of small pores, one smaller than the other, is conspicuous. Similar pairs are prominent in submargin, in subdorsal area and on each abdominal segment.

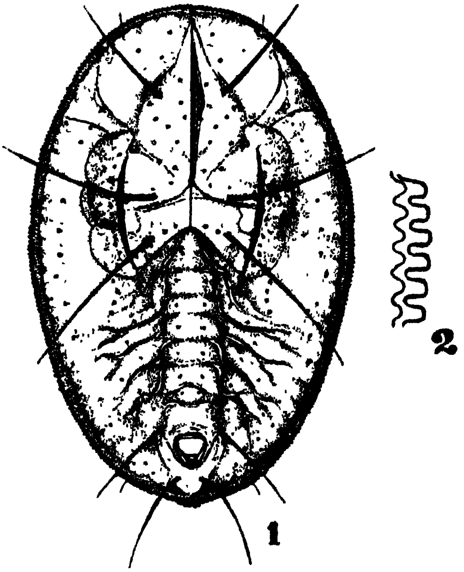

Fig. 64. *Aleurotrachelus anonæ* sp n.
1. Pupa case.
2. Marginal teeth.

Abdominal segments distinct as well as folds. Three pairs of long spines on cephalo-thorax, also a pair latero-anterior to vasiform orifice and a pair near posterior margin. All these spines generally extend beyond margin. Vasiform orifice subcordate, straight anteriorly and rounded posteriorly; operculum generally fills about two-thirds of orifice. The knobbed lingula may be obscured, exposed and included or extended beyond orifice.

Length 0.54 mm., breadth 0.37 mm.

Hosts—*Anona squamosa*, *Morus indica* and *Zingiber* sp.

Localities—Kuala Lumpur and Sepang (Selangor).

This species is closely related to *Aleurotrachelus rubi* Tak. but the small pores exterior to thoracic folds differentiate it from *A. rubi* Tak.

Aleurotrachelus mesuæ sp. n. (Fig. 65).

Pupa case on undersurface of leaf, dull black under a slight deposit of wax with a broad white waxy fringe. Shape elliptical, pointed anteriorly and posteriorly; margin with two rows of teeth, both broadly rounded. Ridge prominent terminating anteriorly in a marked arrow-shaped projection. From this ridge arise a pair of folds anteriorly in cephalothorax and three pairs posteriorly in the abdomen, all almost reach margin. Three pairs of short spines—the posterior pair extending just beyond

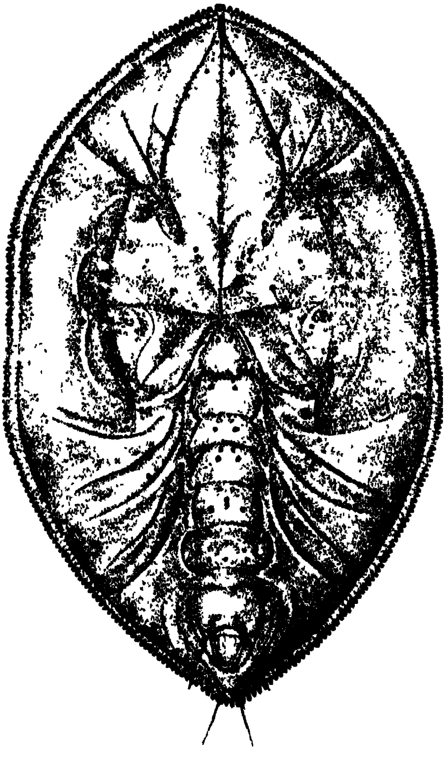

Fig. 65. *Aleurotrachelus mesuæ* sp. n.
Pupa case.

thoracic lateral folds—are present on the cephalo-thorax. There are also a pair of spines near latero-anterior margin of vasiform orifice and near posterior margin of case. Just within margin is a ring of about forty-eight small pores (not in pairs). This species is characterised, however, by having throughout the dorsum small pores—one small and one slightly larger—arranged in pairs. These are especially prominent on the abdominal segments and are arranged as figured. Vasiform orifice elongate with anterior and posterior margin rounded. Operculum subcordate; lingula is obscured.

Length 0.62 mm., breadth 0.38 mm.

Hosts—*Mesua ferrea* and *Adinobotrys atropurpureus.*

Locality—Kuala Lumpur (Selangor).

A single specimen collected on *Morus indica* is similar if not identical with *Aleurotrachelus mesuæ.*

Aleurotrachelus tuberculatus sp. n. (Fig. 66).

Pupa case on undersurface of leaf, singly, black with very slight lateral secretion. Shape obovate but it is difficult to obtain a uniform mount. Margin two rows of teeth, both serrate. Thoracic suture runs to margin, transverse to lateral folds. A pair of thoracic and three pairs of

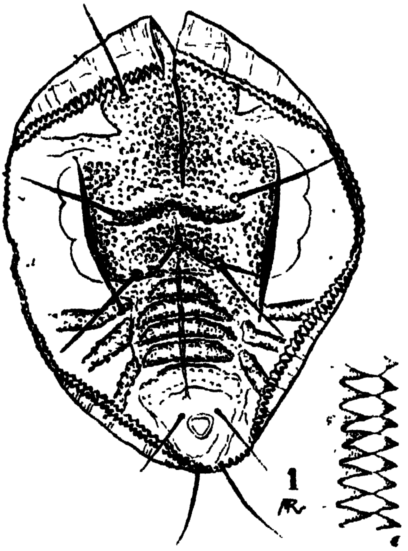

Fig. 66. *Aleurotrachelus tuberculatus* sp. n.
1. Pupa case.
2. Marginal teeth.

abdominal folds almost reaching margin are conspicuous. The abdominal segments are defined and the arrow-shaped structure anteriorly is very broad. The lateral thoracic folds are prominent and another fold runs anteriorly from vasiform orifice to about transverse suture. Small black tubercles are prominent in the mid-dorsal area of the cephalo-thorax, especially along thoracic sutures, the anterior and posterior margins of each abdominal segment and the margins of the abdominal folds. Three pairs of long spines are situated subdorsally on the cephalo-thorax, a pair near anterior lateral margin of vasiform orifice and near posterior margin of case. No pores are evident but a few very minute spines on the cephalo-thorax and abdominal segments and a ring of similar spines in submargin may be seen. The details of the vasiform orifice are not clear: in all specimens it is covered with a fold but it and the operculum seem to be subcordate.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Aleurotrachelus erythrinæ sp. n. (Fig. 67).

Pupa case on undersurface of leaf, black, surrounded with white waxy fringe and dorsal surface with a slight white waxy deposit. Shape elliptical, pointed anteriorly. Margin with conspicuous double row of teeth, upper row

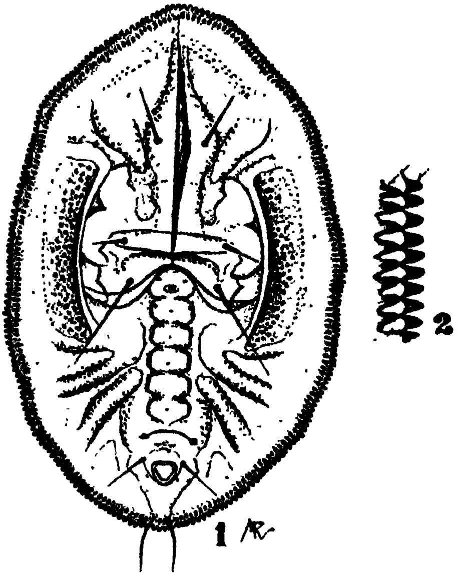

Fig. 67. *Aleurotrachelus erythrinæ* sp. n.
1. Pupa case.
2. Margin.

more rounded than lower. Just within margin a ring of very small spines. Case characterised by general absence of pores. Abdominal ridge distinct and arrow-shaped projection in cephalo-thorax evident. A very small pore mid-dorsally on each abdominal segment is characteristic and one minute tubercle laterally and a small transverse elliptical pore in mid-dorsal line of first abdominal segment may also be seen. Abdominal folds distinct, terminate before reaching margin and lined on their margins with pigmented spots. Lateral thoracic fold prominent and half area between its external margin and margin of case densely covered with pigmented spots. Minute tubercles following the margin anteriorly in cephalo-thorax are evident. Three pairs of long spines on cephalo-thorax are conspicuous and in some specimens extend beyond margin. In addition to these spines, a pair near lateral anterior margin of vasiform orifice and at posterior margin of case are present. Vasiform orifice subcordate, operculum is slightly constricted in middle and obscures lingula.

Length 0.59 mm., breadth 0.43 mm.

Hosts—*Erythrina stricta*, *Derris elliptica* and *Centrosema plumieri*.

Localities—Kuala Lumpur (Selangor) and Kuala Pilah (Negri Sembilan).

The single row of small pores mid-dorsally on the abdominal segments and a general absence of pores are distinguishing characters of this species.

Aleurotrachelus vitis sp. n. (Fig. 68).

Pupa case on undersurface of leaf, slightly transparent, without lateral or dorsal secretion. Shape elliptical. Margin double row of teeth, lower teeth broad, upper smaller and acute. A ring of inconspicuous pores runs around case at base of teeth. Trachea-like ridge prominent terminating anteriorly in the arrow-shaped structure. The cephalo-thoracic and abdominal folds conspicuous almost reaching margin. Transverse suture reaches longitudinal folds and there is a prominent suture between meso- and meta-thoracic segments. Case with three pairs of cephalo-thoracic spines not extending to margin, with a pair latero-anterior to vasiform orifice and a pair near posterior margin of case. Dorsum with minute pores, the most prominent being fourteen septate pores running externally to lateral fold; in addition, six pores in pairs (one larger than the other: these may be a small pore with a minute spine in its vicinity) in mid-dorsal line of abdominal segments; six similar pairs subdorsally on the abdomen and similar pairs along thoracic suture and in the vicinity of rudimentary legs. Vasiform orifice cordate, the anterior margin rounded and slightly protruding, operculum is constricted in its middle, almost fills orifice and conceals the lingula.

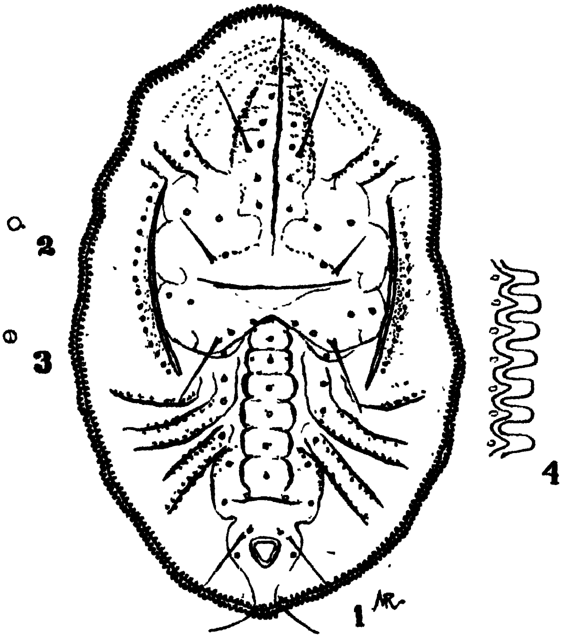

Fig. 68. *Aleurotrachelus vitis* sp. n.

1. Pupa case.
2. Dorsal pore.
3. Septate pore.
4. Marginal teeth.

Length 0.60 mm., breadth 0.42 mm.

Host—*Vitex* sp.

Locality—Kuala Lumpur (Selangor).

Aleurotrachelus lumpurensis sp. n. (Fig. 69).

The appearance on leaf unknown, but probably yellowish, without dorsal or lateral secretion and on under-surface of leaf. After clearing case is colourless. Shape elliptical, margin with a double row of teeth, the teeth of the lower being longer than the upper. There are about two hundred and eighty teeth in each row which being superimposed on each other are not readily differentiated. Neither tracheal folds and pores nor caudal pores and furrows present. The pupa case is singular in having no long spines on dorsum; a pair of short spines from anterior margin arises at about the fourteenth pair of teeth and a posterior lateral pair at about the eighteenth pair of teeth. The thoracic longitudinal folds are represented by chitinised linear thickenings without pigmented spots or without a line of pores. Abdominal segments differentiated, armed with a minute pore (spine) on each lateral margin and with one on mid-dorsal line of third, fourth, fifth and sixth segments. Small pores (spines) are sparsely distributed and seven line each side of the mid-thoracic suture. Abdominal folds subdorsally are only slightly evident. The mid-thoracic suture reaches margin, the transverse one beyond lateral thoracic fold. The vasiform orifice is elongated, rounded anteriorly and posteriorly, and comparatively large. It is armed on its lateral and posterior inner margins with small teeth. The operculum is recessed posteriorly and fills about one half of the orifice, the lingula is slightly exposed but its shape and appearance are ill-defined in the specimen.

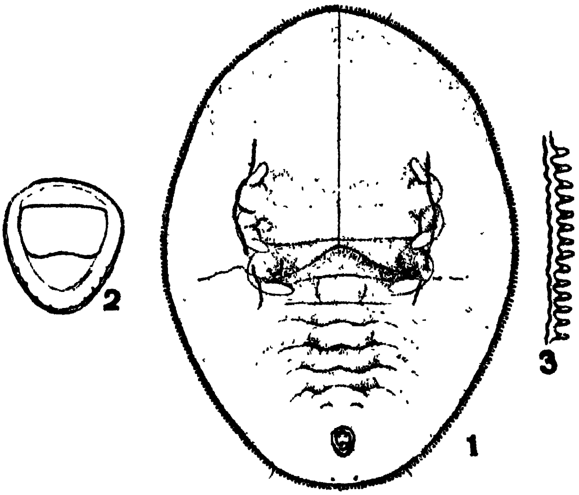

Fig. 69. *Aleurotrachelus lumpurensis* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Marginal teeth.

Length 0.62 mm., breadth 0.46 mm.

Host—*Nephelium lappaceum.*

Locality—Kuala Lumpur (Selangor).

Aleurotrachelus rotundus sp. n. (Fig. 70).

Pupa case yellowish, without secretion, singly, on undersurface of leaf. Shape subcircular. Margin with a double row of teeth, the longer more acute than the shorter which are more rounded. The smaller ring of teeth, however, is not conspicuously defined. The teeth at the usual position of the tracheal and caudal folds are slightly more prominent than the marginal teeth and at the thoracic "pores" a semicircular area seems to be indicated. No indication of caudal fold. Transverse suture distinct, but disappears into the thoracic longitudinal folds. Mid-thoracic suture reaches anterior margin. Abdominal segments distinct giving to the case the appearance of a rhachis; their sutures extend into subdorsal area. Marginal sutures moderately conspicuous. Vasiform orifice subcordate and inner and posterior margins armed with about eight prominent teeth. The other details are not defined in the specimen but the operculum appears to be recessed, filling about half orifice, and the lingula to extend to the inner posterior margin of vasiform orifice.

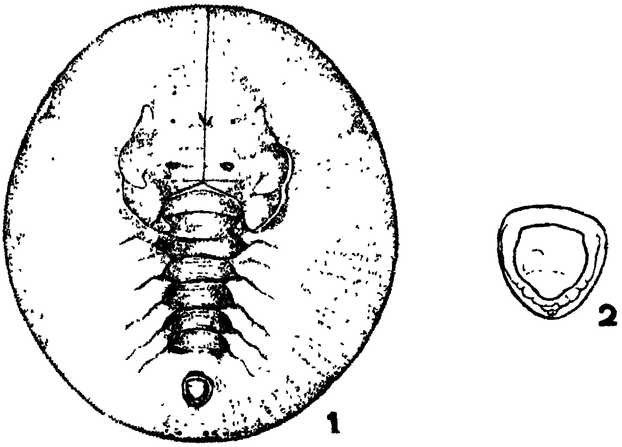

Fig. 70. *Aleurotrachelus rotundus* sp. n.
1. Pupa case.
2. Vasiform orifice.

Length 0.8 mm., breadth 0.7 mm.

Host—*Adinobotrys atropurpureus.*

Locality—Kuala Lumpur (Selangor).

Aleurotrachelus joholensis sp. n. (Fig. 71).

Pupa case on undersurface of leaf, pale yellowish, without apparent secretion. Shape elliptical. Marginal teeth in two rows difficult to differentiate, outer teeth longer and more conical. A wide marginal band surrounds case, appears to be due to prolongation of sutures between the bases of marginal teeth. Thoracic pore not indicated and pores on case absent. Without arrow-shaped prolongation anteriorly and without rhachis appearance. Abdominal sutures without thickenings and moderately evident beyond subdorsum. Transverse suture reaches longitudinal folds, the thoracic terminates before reaching margin. Suture between second and third thoracic segment conspicuous. The bases of five pairs of spines are represented, of which three pairs are on cephalo-thorax, one pair near anterior lateral margin of vasiform orifice and a pair near posterior margin. Longitudinal thoracic folds distinct with small tubercles in three groups, anterior with ten, middle with six and posterior with four. Vasiform orifice cordate, anterior margin slightly rounded, and inner margins with fine teeth. Operculum fills about two-thirds of orifice, and recessed posteriorly: lingula may just be exposed but ill-defined in specimen.

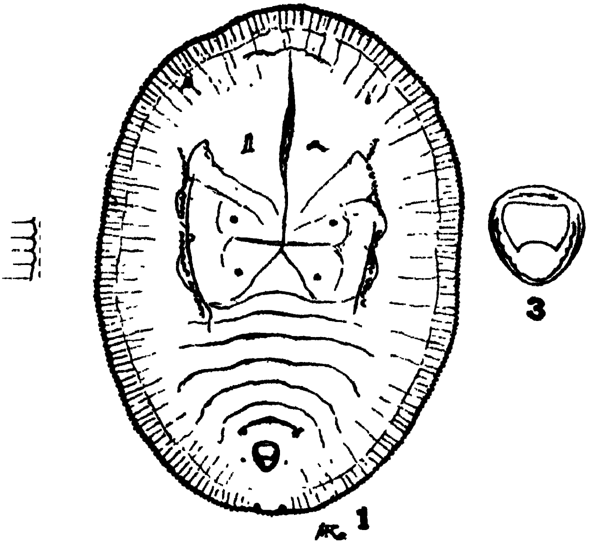

Fig. 71. *Aleurotrachelus joholensis* sp. n.

1. Pupa case.
2. Margin.
3. Vasiform orifice.

Length 0.70 mm., breadth 0.50 mm.

Host—Unidentified.

Locality—Johol (Negri Sembilan).

Aleurotrachelus joholensis Corb. may be distinguished from *A. elatostemæ* Takah. by having a marginal rim, from *A. micheliæ* by having no circular pores, and from *A. turpinæ* by having no minute ducts.

Genus **Aleurothrixus** Quaintance and Baker.

U.S. Dept. Agric., Tech. Series, No. 27, Part II, p. 103, 1914.

Aleurothrixus silvestris sp. n. (Fig. 72).

Pupa case on undersurface of leaf, yellowish-white, no marginal secretion. Shape elliptical, somewhat angular, slightly emarginate posteriorly and pointed anteriorly. Marginal teeth arranged in two rows, the outer longer than wide and somewhat pointed, inner teeth widely rounded. Mid-thoracic reaching, but transverse suture not reaching, margin. Abdominal sutures hardly discernible. Cephalo-thorax anteriorly with two ridges running obliquely to margin. Tracheal and caudal folds and teeth absent. A few simple spines as well as minute circular pores on dorsum. Fifteen pairs of small simple pores near base of marginal teeth surround case. Two pairs of prominent capitate spines on anterior median area of abdomen, a pair of long spines latero-anteriorly to vasiform orifice and a small pair mid-way between posterior margin of vasiform orifice and margin of case. Vasiform orifice elongate, rounded anteriorly and posteriorly, slightly longer than wide and armed with fine teeth on lateral and posterior

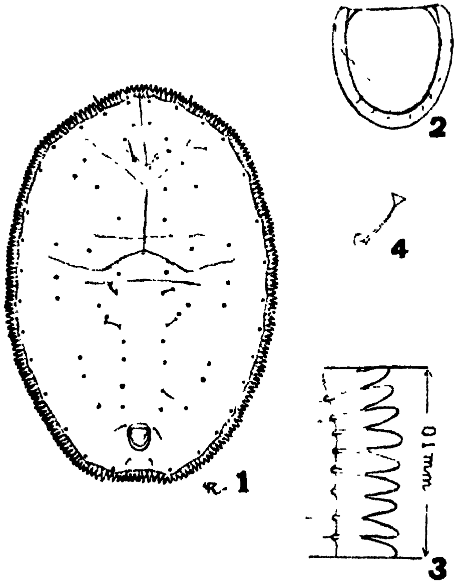

Fig. 72. *Aleurothrixus silvestris* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Marginal teeth.
4. Capitate spine.

margins. Operculum straight anteriorly, much longer than wide, rounded posteriorly and almost fills the orifice. Lingula not exposed, but through the operculum is seen to be globular and setose.

Length 0.94 mm., breadth 0.66 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Closely related to *Aleurothrixus antidesmæ* Tak. differing from it essentially in the shape of the operculum and in having fifteen pairs of small submarginal pores.

Genus **Trialeurodes** Cockerell.

Proceedings Acad. Philadelphia, Volume 54, 1902.

Trialeurodes malayensis sp. n. (Fig. 73).

Pupa case on undersurface of leaf, yellowish, without secretion. Shape elliptical. Margin finely crenulate. Arising just within but projecting beyond the margin, there are about sixty-seven pairs of conically-shaped papillæ of which seven occupy 0.1 mm. and which give to the case the appearance of a serrated margin. Tracheal pore

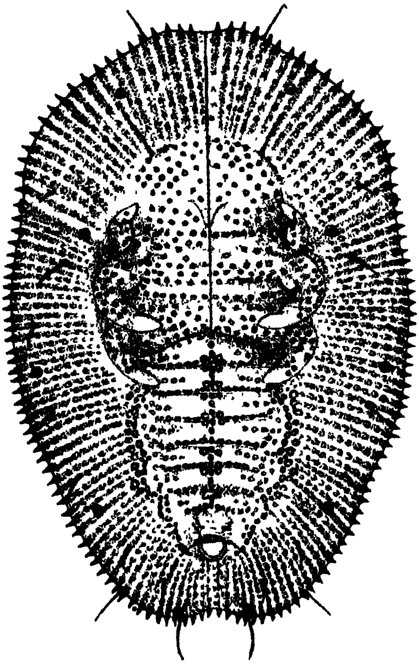

Fig. 73. *Trialeurodes malayensis* sp. n. Pupa case.

slightly extruded but neither pore nor fold conspicuous. Caudal furrow not prominent, but indicated. In submarginal area, a ring of seven pairs of spines, in addition a pair is situated anteriorly in cephalo-thorax, posteriorly to second thoracic pore and near posterior margin of case. The whole derm covered with prominent tubercles which are more heavily chitinised around dorsal disc, and on median line of abdomen. Case generally with five pairs of large pores distributed as follows:—a pair anteriorly in cephalo-thorax, a pair near first pair of legs and three pairs in submarginal area of abdomen, one pair being at the posterior extremity. In two representatives, the second thoracic pair only and in another four pores on one side and three on the other are present. Usual pairs of spines on anterior and latero-posterior margins and latero-anteriorly to vasiform orifice. Vasiform orifice subcordate, almost as broad as long, operculum subcordate, generally filling the case but in some specimens the tip of lingula is slightly exposed.

Length 0.72 mm., breadth 0.51 mm.

Host—Unidentified.

Locality—Rembau (Negri Sembilan).

Trialeurodes silvarum sp. n. (Fig. 74).

Pupa case on undersurface of leaf, usually closely applied, sometimes convex, yellowish, without dorsal or

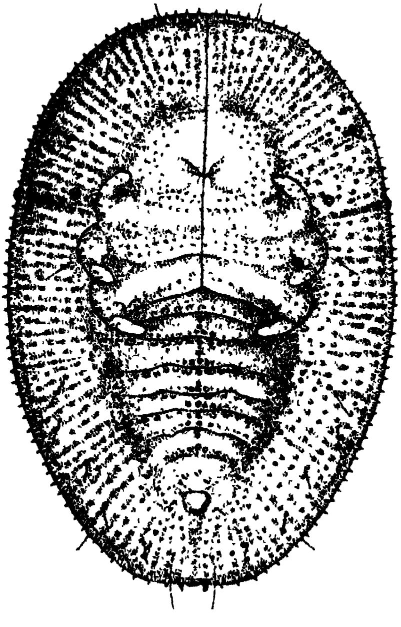

Fig. 74. *Trialeurodes silvarum* sp. n.
Pupa case.

lateral secretion. Shape elliptical. Margin very finely crenulate. Arising just within the margin a ring of about sixty-eight pairs of processes, six occupying 0.1 mm. Tracheal pore and fold slightly indicated. Caudal furrow only slightly indicated. Between dorsal disc and margin a ring of about nine pairs of spines is present. The whole derm is covered with small tubercles. Generally without large pores on dorsum, in one specimen, however, one pair of small pores is present near prothoracic legs. Vasiform orifice subrectangular, operculum subcordate, generally filling orifice but sometimes filling about two-thirds leaving tip of lingula exposed.

Considerable variation in size, average length about 0.70 mm. and breadth 0.50 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species is very similar to *Trialeurodes malayensis* Corb. In *T. malayensis* the submarginal processes are larger and closer together than in *T. silvarum*. The dorsal tubercles of *T. silvarum* are not so prominent, especially on the dorsal disc, as those of *T. malayensis*.

Trialeurodes perakensis sp. n. (Fig. 75).

Pupa case on undersurface of leaf, singly, yellowish, without apparent secretion. Shape obovate, broadest across cephalo-thorax and narrowing posteriorly. Margin very

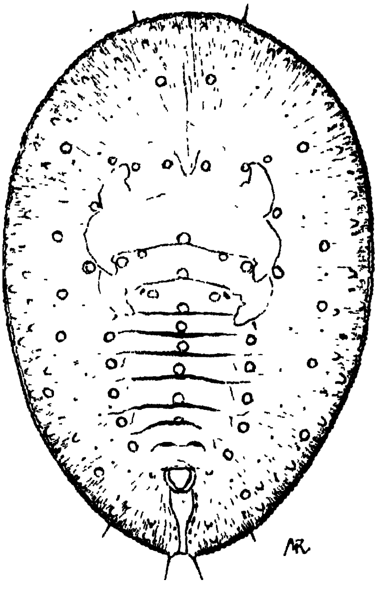

Fig. 75. *Trialeurodes perakensis* sp. n.
Pupa case.

finely crenulate. Thoracic pore and fold not visible. Caudal fold distinct, wide anteriorly, narrowing posteriorly, without markings, ending in a concavity and armed at its termination with two moderately long spines. A pair of long spines appears to be present on the first abdominal segment. Just within margin, two irregular rings of conically shaped papillæ and a ring of short capitate spines. Though not so evident, smaller spines are sparsely distributed throughout dorsum. In addition to the submarginal papillæ, the case has conspicuous subcircular tubercle-like structures arranged as follows:—twelve laterally, eighteen subdorsally, four transversely near mouth parts, four on third thoracic segment, two on first abdominal segment and eight on median line. Abdominal sutures distinct, without chitinised thickenings. Vasiform orifice about as broad as long, anterior margin protruding and slightly notched on its outer posterior margin, operculum subcordate, lingula concealed.

Length 0.66 mm., breadth 0.49 mm.

Host—*Palaquium gutta.*

Locality—Batu Gajah (Perak).

This species is described from one specimen. It differs from a typical *Trialeurodes* in the lingula being obscured and in some other characters and a new genus should possibly be erected to include it.

Trialeurodes palaquifolia sp. n. (Fig. 76).

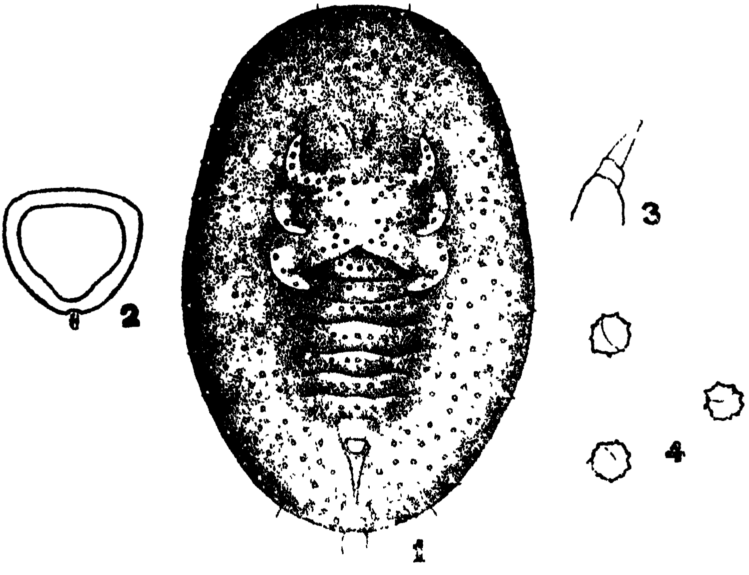

Fig. 76. *Trialeurodes palaquifolia* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Marginal papilla.
4. Dorsal tubercles.

The pupa case of *Trialeurodes palaquifolia* was found when mounting other Aleurodid material from gutta percha and its appearance is therefore not known. Shape elliptical. Margin crenulate. Fourteen pairs of small submarginal papilla-like processes surround the case, the apices about reaching margin. Tracheal pores and folds absent. The caudal fold is wide anteriorly, narrow in the middle and broadens again at its termination. A pair of small spines on anterior and posterior lateral margins are present and a pair arms the termination of the caudal fold. The whole of the case is studded with small rounded tubercles. In addition, smaller tubercles are present on the abdominal and thoracic segments. The vasiform orifice is obscured and its details are not easily made out but appears to be slightly broader than long with the posterior margin recessed; the operculum completely fills the orifice but the tip of the lingula seems to extrude just beyond the posterior margin of vasiform orifice.

Length 0.92 mm., breadth 0.68 mm.

Host—*Palaquium gutta.*

Locality—Batu Gajah (Perak).

Trialeurodes bauhiniæ sp. n. (Fig. 77).

Pupa case yellowish-brown with a palisade of white wax raising it slightly from the undersurface of the leaf.

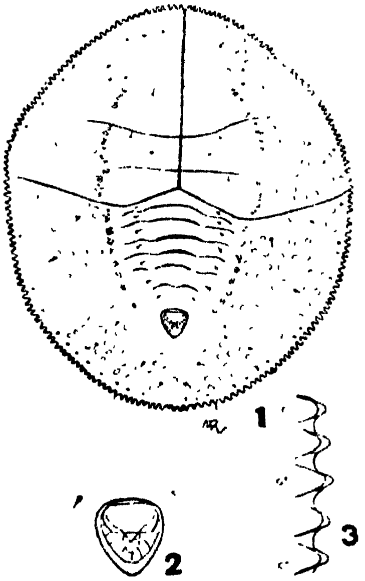

Fig. 77. *Trialeurodes bauhiniæ* sp. n.
1. Pupa case.
2. Vasiform orifice.
3. Margin and submarginal papillæ.

After clearing, the case becomes transparent with the exception of a light brownish colouration of the abdominal segments and of small areas in the cephalo-thorax. Shape subcircular. Margin broadly crenulate. Thoracic pores and folds not indicated. A caudal furrow may be very faintly visible and ends at its termination in a small tooth. Submarginal area with a continuous ring of about one hundred and ninety conically-shaped papillæ and a ring of what appear to be pairs of minute spines. Similar sized spines are generally distributed throughout the dorsum. The area between margin and subdorsum is crowded with conspicuous subcircular porous looking areas and, though not so distinct, extend into the cephalo-thorax. The dorsal disc with the exception of cephalo-thorax anteriorly is differentiated by irregularly shaped tubercles. The abdominal segments are distinct and each segment bears laterally a small hooked spine. The mid-thoracic and transverse sutures reach the margin and are very conspicuous. In some specimens, a suture is situated anteriorly to the first thoracic suture. The vasiform orifice is cordate, rounded anteriorly, somewhat thickened posteriorly and with folds from its lateral margins; operculum is broadest about its middle and fills about half the orifice, leaving the setose lingula exposed but included within the orifice.

Length 0.87 mm., breadth 0.72 mm.

Host—*Bauhinia bidentata.*

Locality—Johol (Negri Sembilan).

Genus **Aleurolobus** Quaintance and Baker.

U.S. Dept. of Agric., Tech. Series 27, pt. II, p. 108, 1914.

Aleurolobus sandorici sp. n. (Fig. 78).

Pupa case elliptical. Margin entire, marginal sutures distinct giving to submargin a somewhat serrated appearance. Submarginal area with a ring of minute pores. Thoracic pore conspicuous, opening just within margin, the fold represented by a clear porous-looking area from which a tooth-like projection arises. Caudal fold very broad with reticulated markings. Submarginal suture distinct. Transverse and mid-thoracic sutures extend to submarginal suture. Irregularly shaped pore-like bodies anteriorly to first thoracic suture and anteriorly along mid-thoracic suture. Similar bodies, varying in size, the largest being placed near the sutures, are present on median line of abdominal segments. In addition, two pairs of subcircular porous looking areas on second and one on third thoracic segments are evident. Abdominal sutures distinct without chitinised thickenings. Palmate area around vasiform orifice not defined. Vasiform orifice transversely elliptical

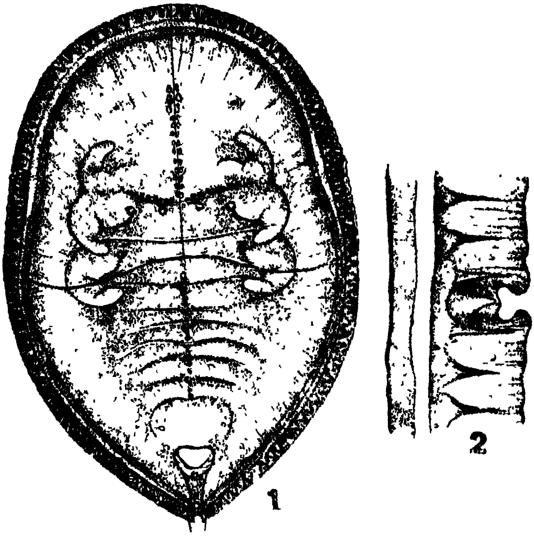

Fig. 78. *Aleurolobus sandorici* sp. n.

1. Pupa case.
2. Tracheal pore and margin.

and recessed at outer posterior margin. (Operculum is missing from the specimen).

Length 0.52 mm., breadth 0.38 mm.

Host—*Sandoricum indicum.*

Locality—Kuala Lumpur (Selangor).

This species is described from one pupa case which was found when mounting other material collected on *Sandoricum indicum.*

Aleurolobus phyllanthi sp. n. (Fig. 79).

Pupa case slightly raised from undersurface of leaf, dull black, and without evident secretion. Shape broadly elliptical. Case remains brown after prolonged boiling. Margin entire. Submarginal area about 0.05 mm. in breadth, with conspicuous striæ and with a ring of small pores. Submarginal area and entire case crowded with very small spots. Tracheal pore, without projection, opens just within margin, fold represented by a clear-like area, in some specimens extending to submarginal suture. Caudal fold narrow terminating just within margin. With the exception of submarginal area and dorsal disc, case prominently reticulated. Eye spots present. Transverse and thoracic sutures reach submarginal suture.

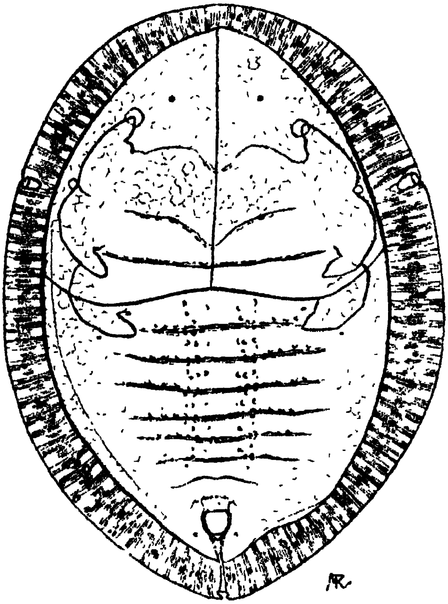

Fig. 79. *Aleurolobus phyllanthi* sp. n. Pupa case.

Abdominal sutures lined anteriorly and posteriorly with somewhat linear dark brown pigmented chitinised thickenings. Vasiform orifice subcordate, posterior outer margin divided, operculum similar in shape obscuring lingula.

Length 0.56 mm., breadth 0.42 mm.

Host—*Phyllanthus frondosus.*

Locality—Kuala Lumpur (Selangor).

Aleurolobus selangorensis sp. n. (Fig. 80).

Pupa case singly, on undersurface of leaf, black, surrounded with a slight yellowish wax fringe. Eye spots yellowish. The depression separating the submarginal area is distinct and abdominal segments defined. Shape broadly elliptical. The case is not cleared easily but after boiling becomes brown and subsequently colourless. Margin toothed. The thoracic and caudal pores are represented by a conspicuous somewhat triangular shaped tooth. The tracheal pore has internally a subcircular porous area and the fold is sparsely dotted near submarginal suture and as far as mesothoracic legs. Caudal fold generally splashed anteriorly with dots, armed with teeth on its inner margins and terminating in the triangular shaped caudal tooth. Submarginal area is about 0.11 mm. in breadth, its sutures to the submarginal depression are defined and are lined with pigmented spots. Within the depression there are ten pairs of small spines. The mid-thoracic suture runs to area of submarginal suture, the transverse to submarginal demarcation. Dorsal disc with corrugations and the abdominal sutures not well defined. Eye spots reniform. Vasiform orifice cordate with inner lateral margins armed with about seven pairs of conspicuous teeth, larger posteriorly. The posterior outer margin with apparently three to four projections, operculum is similarly shaped and conceals the lingula. Trilobed area not defined.

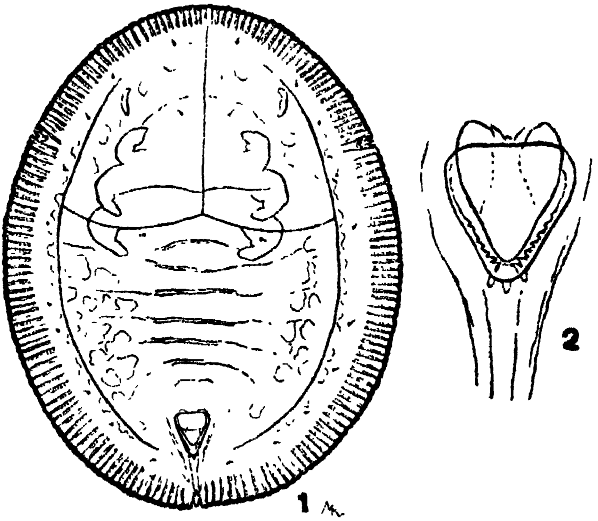

Fig. 80. *Aleurolobus selangorensis* sp. n.
1. Pupa case.
2. Vasiform orifice.

Length about 0.86 mm., breadth 68 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Aleurolobus musæ sp. n. (Fig. 81).

This species has been described from one pupa case which was found among other Aleurodid material from banana. All its characters are not defined but those that are distinct separate it from described species of *Aleurolobus*. The drawing is as the case appears, no attempt has been made to make it uniform. Shape elliptical. Margin toothed. Tracheal pore is represented by a single prominent tooth and the tracheal fold is markedly spotted. The posterior portion of the case is broken thereby rendering the description of the caudal pore and fold impossible although the latter anteriorly seems to be dotted. The submarginal area is separated by an irregular and somewhat interrupted fold, rather than by a suture-like line or depression. Near to this fold are at least nine pairs of moderately short spines, the bases only of most remaining. In addition a similar pair of spines is present in cephalo-thorax and on first abdominal segment. The abdominal segments are distinct, the sutures having the appearance of narrow folds. Transverse folds in the thorax and longitudinal folds in the abdomen are also evident. The vasiform orifice is cordate and has reticulated markings. Four prominent teeth are seen projecting from its outer posterior margin. There is no indication of palmate area surrounding the vasiform orifice.

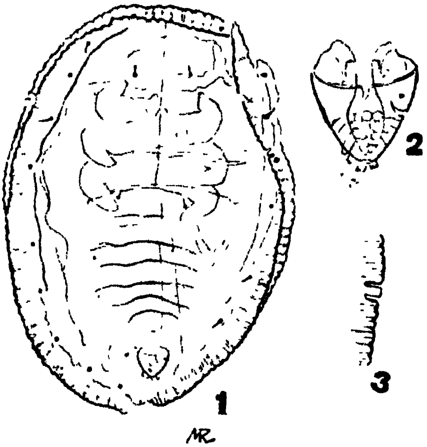

Fig. 81. *Aleurolobus musæ* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal tooth.

Length 1.10 mm., breadth 0.08 mm.

Host—*Musa sapientum.*

Locality—Dusun Tua (Selangor).

The single toothed tracheal pore with the conspicuously dotted tracheal fold together with the submarginal spines and the reticulations of the vasiform orifice are characters distinguishing this species.

Aleurolobus pulcherrimus sp. n. (Fig. 82).

On undersurface of leaf, singly, black with no marginal fringe. Shape elongate elliptical, slightly constricted in region of thoracic pores and narrowing posteriorly. Margin finely crenulate, with anterior and posterior lateral marginal spines. Submarginal area separated anteriorly by a suture, posteriorly less defined, with a ring of small spines and with rounded prominent projections about six to 0.1 mm., each with two prominent striæ.

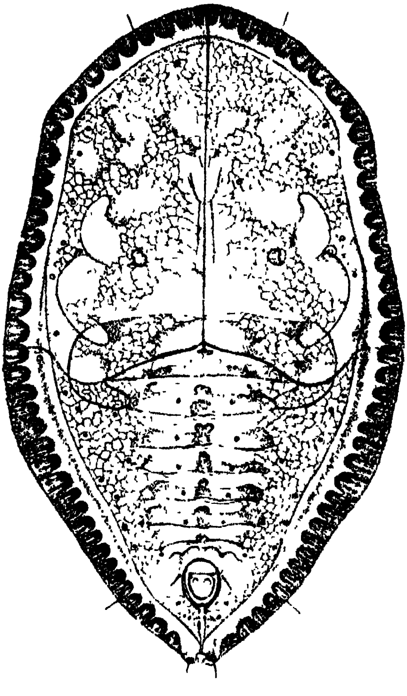

Fig. 82. *Aleurolobus pulcherrimus sp. n.*
Pupa case.

Tracheal pore small opening at margin and thoracic fold represented by a subcircular area. Caudal fold narrow. Transverse suture reaches submarginal suture. With exception of abdominal segments and submarginal area, case conspicuously reticulated. Minute spines generally distributed throughout derm. Abdominal segments with median chitinised thickenings and with sutures distinct. A pair of short spines on first abdominal segment. Vasiform orifice subcordate, anterior margin projecting and outer posterior margin divided, operculum similar in shape filling orifice and obscuring lingula.

Length about 0.60 mm., breadth about 0.35 mm.

Host—*Erythrina stricta.*

Locality—Kuala Pilah (Negri Sembilan).

Genus **Aleurotuberculatus** Takahashi.

"'Aleyrodidæ of Formosa, Part I," Report No. 59, March 1932, Dept. Agric., Japan.

Aleurotuberculatus psidii (Singh). (Fig. 83).

Aleurotrachelus psidii Singh. Mem. Dept. Agri., India, Ent. Ser. XII, p. 61, 1931.

Aleurotuberculatus psidii Singh. "Aleyrodidæ of Formosa, Part I," Report 59, p. 20, March 1932, by Ryoichi Takahashi.

This species was originally described by Karam Singh as *Aleurotrachelus psidii* from *Psidium guyava,* Pusa. Takahashi in 1932 placed it in his genus *Aleurotuberculatus* and recorded it from Formosa on *Euphoria longana, Mæsa* sp., *Cinnamomum camphora, Psidium guyava, Salix* sp. and *Bridelia ovata.*

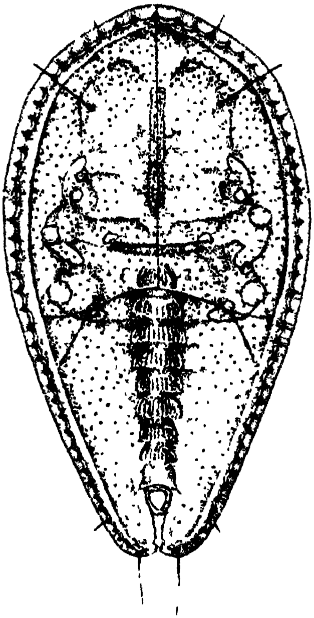

Fig. 83. *Aleurotuberculatus psidii* (Singh).
Pupa case.

Hosts in Malaya—*Cinnamomum zeylanicum, Vitex* sp., *Dillenia indica, Persea gratissima, Psidium guajava* and *Artocarpus* sp.

Localities—Kuala Lumpur and Pudu (Selangor).

Aleurotuberculatus minutus (Singh).

Dialeurodes minutus Singh. Dept. of Agriculture, India, Ent. Ser. XII, p. 42 (1931).

Aleurotuberculatus minutus Singh. "Aleyrodidæ of Formosa, III," p. 50, Report No. 63, 1934, Takahashi.

Singh records this species on *Ixora coccinea* from Pusa.

Hosts in Malaya—*Ixora* sp. and *Gardenia florida.*

Locality—Kuala Lumpur (Selangor).

Aleurotuberculatus cherasensis sp. n. (Fig. 84).

Pupa case singly, on undersurface of leaf, no secretion, almost transparent, widest across first abdominal segment, narrowing anteriorly and posteriorly. Margin entire. Both thoracic and transverse sutures reach margin. Submarginal area differentiated. Dorsal disc not tessellated. Three pairs of tubercles on cephalo-thorax and one pair on first abdominal segment. Abdomen shorter in length than thorax and subdorsally with three pairs of rounded tubercles. Thoracic fold not discernible, thoracic cleft below line of margin. No small chitinised area near cleft present. Each abdominal segment has a pair of very minute spines, similar sized spines are present on thorax. Caudal furrow distinct without markings, narrow anteriorly and widening posteriorly. Vasiform orifice small, subcordate and without teeth, operculum similarly shaped,

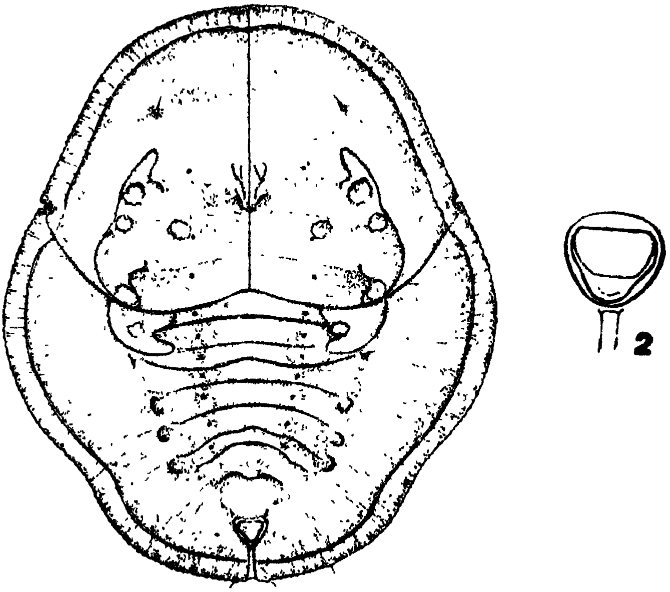

Fig. 84. *Aleurotuberculatus cherasensis* sp. n.
1. Pupa case.
2. Vasiform orifice.

slightly constricted posteriorly, filling orifice and obscuring lingula.

Length 0.46 mm., breadth 0.36 mm.

Host—*Psidium guajava.*

Localities—Cheras and Kuala Lumpur (Selangor).

This species differs essentially from *A. minutus* Singh in not having the dorsum tessellated and from *A. suishanus* Tak. in possessing three pairs of tubercles on sub-dorsum of abdomen.

Aleurotuberculatus tentactuliformis sp. n. (Fig. 85).

Pupa case on undersurface of leaf, colourless, slightly raised from leaf, without secretion. Shape elliptical, flattened anteriorly, broadest about first abdominal segment, narrowing considerably posteriorly. Margin finely crenulate, marginal rim differentiated, case surrounded with a ring of about thirty-eight pairs. fourteen pairs anterior to thoracic cleft, of long simple spinous processes joined at their bases. Thoracic cleft indistinct, slightly depressed and situated between a pair of shorter processes.

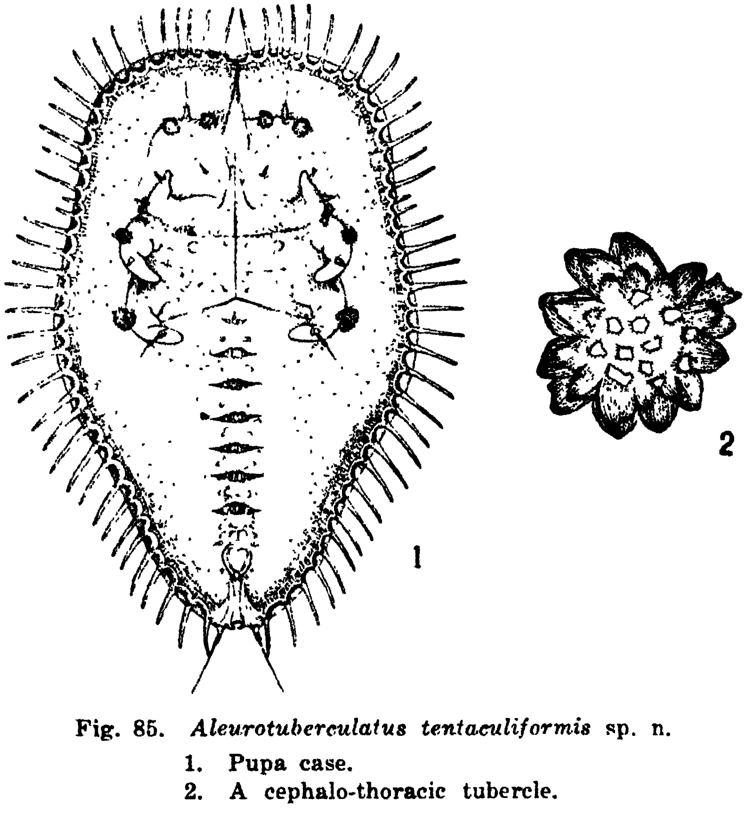

Fig. 85. *Aleurotuberculatus tentaculiformis* sp. n.

1. Pupa case.
2. A cephalo-thoracic tubercle.

Thoracic fold indistinct. Caudal fold prominent, without markings and ending in a concavity. Entire case densely covered with small generally bifurcated spinous processes. Mid-abdominal region prominent; chitinised areas on median line of each abdominal segment and armed laterally with a robust spine. Four pairs of tubercles present on cephalothorax, two pairs anteriorly placed. In addition to these tubercles, short spine-like tubercles are also present. The case has a pair of small jointed spines anteriorly on cephalothorax, on first abdominal segment and at termination of caudal fold. Vasiform orifice subcordate, without teeth, anteriorly prominently protruding and posteriorly cleft.

Length 0.59 mm., greatest breadth 0.40 mm.

Hosts—*Conocephalus subtrinervius* and unidentified plants.

Localities—Kuala Lumpur (Selangor), Cameron Highlands (Pahang), Rembau (Negri Sembilan).

Aleurotuberculatus eugeniæ sp. n. (Fig. 86).

Pupa case colourless, singly, without secretion on undersurface of leaf. Shape subovate, slightly constricted at tracheal pores. Margin entire and just within margin two rings of small tooth-like projections are seen. Submarginal area defined by a suture-like line around case. Tracheal pore circular and opens on the dorsal surface, fold

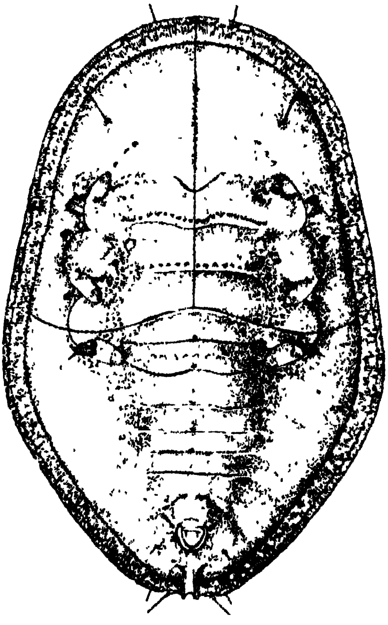

Fig. 86. *Aleurotuberculatus eugeniæ* sp. n.
Pupa case.

not discernible. Caudal fold unmarked, broad, slightly narrow about middle. Thoracic, and in some specimens, transverse sutures, extend to margin: small tubercle-like processes are present along thoracic sutures and near rudimentary legs. Similar processes absent subdorsally in abdomen. Abdominal segments distinct with small chitinized thickenings in median line. In cephalo-thorax adjacent to rudimentary legs, three pairs of prominent conically-shaped tubercles, the anterior pair being the largest. Another large pair is also situated on the basal abdominal segment. Two pairs of moderately long spines are present, one on cephalo-thorax and one on basal abdominal segment. Vasiform orifice subcordate, outer posterior margin broadly recessed, operculum similar in shape and obscuring lingula.

Length 0.53 mm., breadth 0.36 mm.

Hosts—*Eugenia jambos* and *Eugenia aquea.*

Locality—Kuala Lumpur (Selangor).

Aleurotuberculatus canangæ sp. n. (Fig. 87).

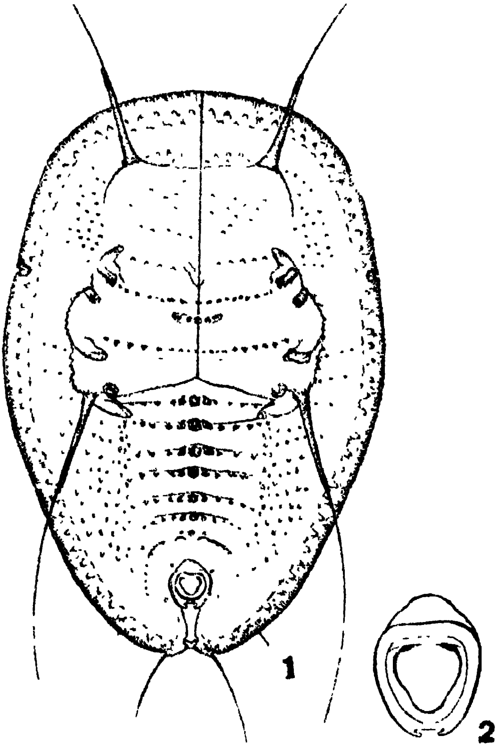

Fig. 87. *Aleurotuberculatus canangæ* sp. n.
1. Pupa case.
2. Vasiform orifice.

Pupa case on undersurface of leaf, yellowish with dark central area and without wax secretion. Shape elliptical. Margin finely crenulate with wax tubes moderately distinct; submarginal area differentiated by a ring of about seventy-six conically-shaped papillæ. Thoracic cleft just within margin and fold represented by a semicircular area. Caudal fold distinct without markings and armed at its termination with a pair of simple spines. The derm and thoracic and abdominal sutures lined with small tubercles with larger tubercles in median line of first five abdominal sutures. A pair of large blunt tubercles is placed on pro-, meso- and metathoracic segments as well as near the long spines on basal abdominal segment. A pair of long two-jointed spines, basal joint stouter and shorter, is situated anteriorly on cephalo-thorax and on basal abdominal segment. Vasiform orifice subcordate projecting anteriorly, broadly recessed posteriorly, operculum similar in shape, filling orifice and obscuring lingula.

Length 0.60 mm., breadth 0.40 mm.

Hosts—*Cananga odorata* and *Psidium guajava.*

Locality—Kuala Lumpur (Selangor).

Aleurotuberculatus macarangæ sp. n. (Fig. 88).

Pupa case on undersurface of leaf, whitish, without dorsal or marginal secretion. Shape elliptical. Margin finely toothed, submarginal area separated by a crenulate line which has small papillæ on its outer margin. Tracheal cleft prominent with its fold represented by an oval shaped area extending only through submarginal area. Caudal fold wide anteriorly, narrowing posteriorly and ending in a cleft. Three series of small pores are present in the abdomen, one situated submedially, one subdorsally and one submarginally. Between the submarginally and the subdorsally placed pores, small tubercles are present. The abdominal sutures extend to this area and each has two to three small tubercles placed in median line. The thoracic sutures are indicated by the presence of small tubercles. Mid-thoracic suture extends to margin whilst the transverse reaches submarginal differentiation. Prominent tubercles are not present in cephalo-thorax. Two pairs of two-jointed spines, one pair anteriorly in cephalo-thorax and one posterior to transverse suture. The distal joint of these spines may be short with the apex blunt or fine and long, about six times longer than the basal joint. In addition to these spines, a pair of two-jointed spines, the apices of which are not blunt, arm caudal fold. Vasiform orifice subcordate with walls thickened, without teeth, protruding anteriorly and broadly recessed posteriorly. Operculum subcordate, straight anteriorly, almost filling orifice and obscuring lingula.

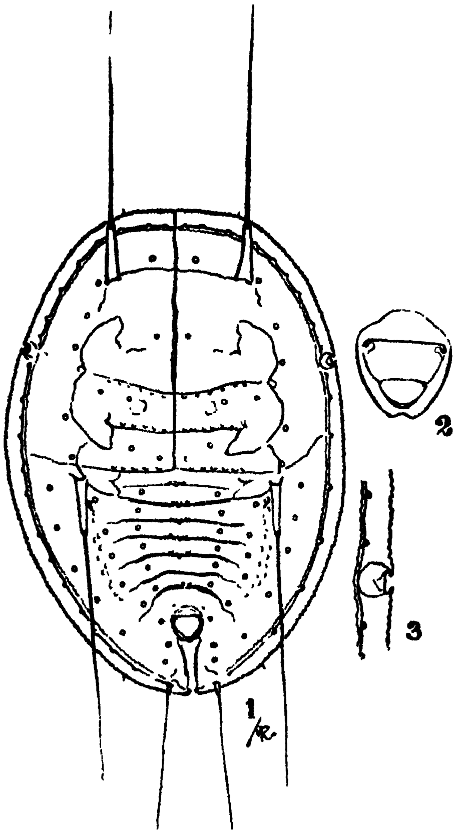

Fig. 88. ***Aleurotuberculatus macarangæ*** **sp. n.**

1. **Pupa case.**
2. **Vasiform orifice.**
3. **Tracheal cleft.**

Length 0.54 mm., breadth 0.36 mm.

Host—*Macaranga* sp.

Localities—Kuala Lumpur and Rawang (Selangor).

Aleurotuberculatus jasmini Tak. (Fig. 89).

"Aleyrodidæ of Formosa, Part I," Report No. 59, Dept. of Agric., Japan, p. 26, 1932.

This species was described by Takahashi from *Jasminum* sp. In the Malayan material collected from *Jasminum* sp. there is a considerable variation, more especially in relation to the shape of the tracheal clefts, the length of the cephalo-thoracic spines and the presence or absence of subdorsal granules. In specimens from the same leaf, the tracheal clefts are as shown below in I, with granules on the subdorsal area of the abdomen and either with short or long spines extending beyond the margin. In other material from Jasmin the cleft is as shown in 4, II as well as in 4, IV, without granules and with short spines. In specimens from other material the cleft is as shown in 4, III, with subdorsal granules and with short spines. In other material the clefts are as in I, with granules present or absent and with short spines or spines extending half way to margin and yet in other material the cleft is as shown in I as well as in 4 IV.

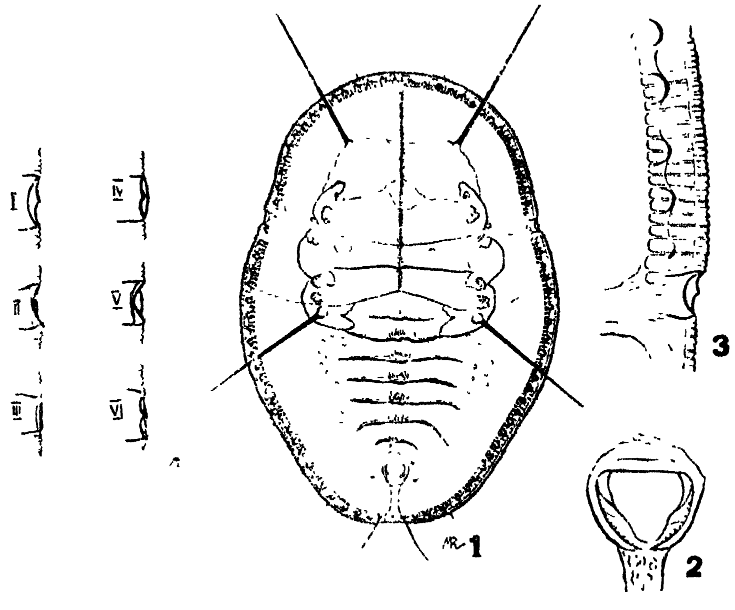

Fig. 89. *Aleurotuberculatus jasmini* Tak.

1. Pupa case from Citrus.
2. Vasiform orifice.
3. Margin and tracheal cleft.
4. Thoracic clefts of different specimens.

Material from Citrus shows the clefts as in I, with or without subdorsal granules and with short or long spines extending beyond margin. In specimens from *Gardenia,* the clefts are as shown in 4, I, V and VI, with and without granules and with cephalo-thoracic spines either very short or long, almost reaching margin.

In these specimens there would not appear to be any variation in the number of tubercles in the cephalo-thoracic area, in the appearance of the submarginal area or in the structure of the chitinised markings on the median line of the abdomen.

Hosts—*Jasminum* sp., *Quisqualis indica, Gardenia florida* and *Citrus* sp.

Localities—Kuala Lumpur, Sepang (Selangor), and Singapore.

Mr. C. P. Clausen of the Bureau of Entomology, U.S.A. who when in Malaya searching for parasites of *Aleurocanthus woglumi* gave me some of my Citrus material which he had collected in Singapore.

Aleurotuberculatus neolitseæ Tak. (Fig. 90).

"Aleyrodidæ of Formosa," Report No. 63, p. 55, Dept. Agric, Japan, 1934.

This species was described by Takahashi in 1934 from Formosa on *Neolitsea acuminatissima.*

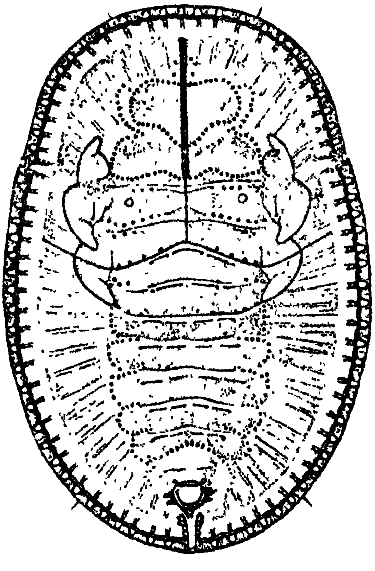

Fig. 90. *Aleurotuberculatus neolitseæ* Tak. Pupa case.

Host in Malaya—*Artocarpus* sp.

Locality—Kuala Lumpur (Selangor).

Aleurotuberculatus nephelii sp. n. (Fig. 91).

Pupa case closely applied to undersurface of leaf, without dorsal or lateral secretion, some yellowish, others colourless. Shape elliptical, broadest across third abdominal segment, slightly emarginate at thoracic clefts and narrowing posteriorly. Margin irregularly crenulate, marginal sutures not conspicuously evident. Transverse and thoracic sutures distinct, former not reaching margin. Thoracic pore appears generally as a semicircular cleft and opens at margin. Caudal cleft subcircular and opens within margin. Thoracic fold not evident: caudal fold conspicuous without markings and terminating within margin. A pair of small spines on anterior and posterior margins, a larger pair in submarginal area near caudal pore and a pair of moderately long spines in cephalo-thorax are present.

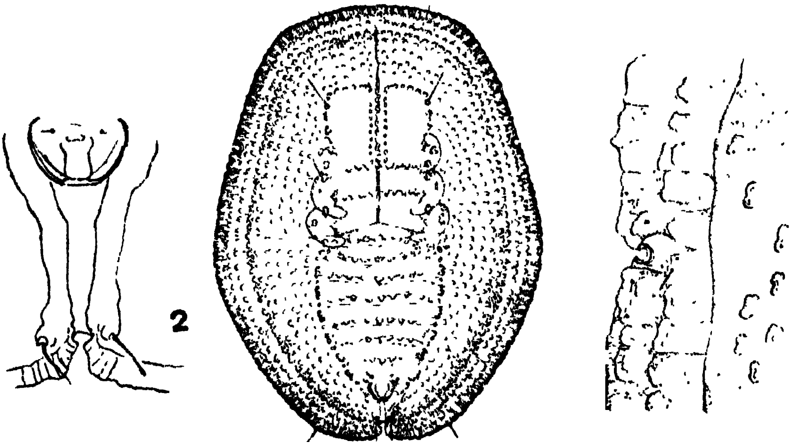

Fig. 91. *Aleurotuberculatus nephelii* sp. n.

1. **Pupa case.**
2. **Vasiform orifice.**
3. **Tracheal cleft and marginal area.**

Area between margin and dorsal disc with from eight to nine rings of tubercles. Abdominal and thoracic sutures rendered more evident by small irregularly shaped tubercles. Slightly larger tubercles border dorsal disc, both in cephalic and abdominal regions, those near rudimentary legs more prominent. Vasiform orifice subcordate, slightly recessed on outer posterior margin, operculum generally filling orifice and obscuring lingula.

Length about 0.65 mm., breadth 0.50 mm.

Hosts—*Ncphelium lappaceum, Conocephalus subtrinervius* and *Artocarpus* sp.

Locality—Kuala Lumpur (Selangor).

Aleurotuberculatus stereospermi sp. n. (Fig. 92).

Pupa case closely applied to undersurface of leaf, flat, whitish, without dorsal or lateral secretion. Shape broadly elliptical, slightly emarginate at thoracic "clefts." Margin finely crenulate. Tracheal "cleft" indicated by absence of crenulations and by margin being slightly extruded. Caudal fold, irregular in outline, without definite markings and terminating in a shallow concavity. Submargin without a ring of marginal or submarginal spines but with papillæ. The usual pair of spines on anterior and posterior lateral margins, a pair anteriorly on cephalo-thorax, on first abdominal segment and near termination of caudal fold are present. Transverse suture reaches submarginal area, thoracic suture the margin. Abdominal sutures without corrugations but anterior to each of the first five abdominal sutures, a blunt median tubercle is present. Similar tubercles are seen near the three pairs of thoracic legs. Vasiform orifice subcordate, without teeth and slightly notched posteriorly. Operculum constricted about middle, narrowing posteriorly, almost filling orifice and obscuring lingula. In some specimens, operculum truncated and recessed posteriorly, leaving lingula slightly exposed but included within orifice.

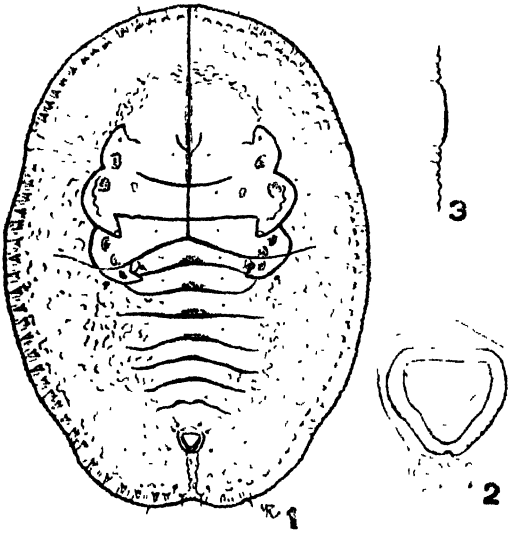

Fig. 92. *Aleurotuberculatus stereospermi* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Tracheal cleft.

Length 0.76 mm., breadth 0.54 mm.

Host—*Stereospermum chelonoides.*

Localities—Johol and Kuala Pilah (Negri Sembilan).

Aleurotuberculatus stereospermi Corb. is similar to *Aleurotuberculatus lithocarpi* Tak. but whereas no tracheal pore or cleft is present in the latter, it is represented by an extrusion of the margin in the former species.

Aleurotuberculatus artocarpi sp. n. (Fig. 93).

Pupa case on undersurface of leaf, yellowish, no wax secretion evident. Shape subovate, slightly depressed near thoracic clefts, broadest across first abdominal segment, narrowing and slightly constricted posteriorly. Margin with thickened crenulations and with a small spinous papilla at each crenulation, giving margin a serrated appearance. No prominent tubercles on dorsum.

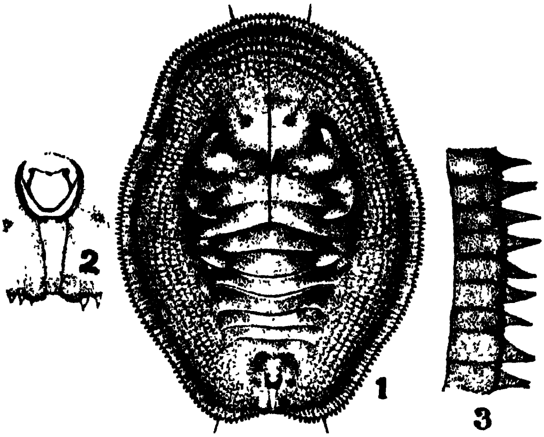

Fig. 93. *Aleurotuberculatus artocarpi* sp. n.

1. Pupa case.
2. Vasiform orifice.
3. Margin and marginal processes.

Tracheal cleft slightly protruding and rendered conspicuous by absence of crenulations and papillæ, thoracic fold not evident. Caudal fold wide, unspotted and terminating at margin in a concavity. Thoracic and transverse sutures distinct, reaching margin. Abdominal and thoracic sutures defined, without tubercles or corrugations. Vasiform orifice subcordate, not toothed, posterior margin recessed; operculum similar in shape, obscuring lingula.

Length 0.55 mm., breadth 0.41 mm.

Host—*Artocarpus* sp.

Locality—Kuala Lumpur (Selangor).

This species closely resembles *Aleurotuberculatus thysanospermi* Tak. described from material collected on *Thysanospermum diffusum* from Formosa. It is not typical of the genus *Aleurotuberculatus* but in its thoracic clefts and shape of vasiform orifice is closely related.

Aleurotuberculatus bauhiniæ sp. n. (Fig. 94).

Pupa case on undersurface of leaf, flat, whitish, no dorsal or lateral secretion. Shape elliptical, slightly emarginate at termination of caudal fold. Margin very finely crenulate. Tracheal cleft indicated by slight depression and by chitinised margin, fold not evident. Caudal fold distinct, irregular in outline, unspotted and terminating in shallow concavity. Transverse suture not extending to margin; mid-thoracic suture reaching margin. Just with margin a ring of about one hundred and twenty pointed papillæ, and from these to subdorsal area in a somewhat regular linear formation small, variously shaped papillæ, mostly pointed, are evident. Abdominal sutures are lined with small pointed tubercles, those near thoracic sutures, though present, are not so conspicuous. Larger tubercles are seen near rudimentary legs. The case is armed with a pair of small spines anteriorly on cephalo-thorax, a pair near termination of caudal fold and a pair on anterior and posterior lateral margins. Vasiform orifice subcordate, prominently protruding anteriorly, somewhat straight posteriorly and without teeth; operculum generally fills orifice but, in some specimens recessed posteriorly, about half-filling orifice and leaving setose lingula exposed.

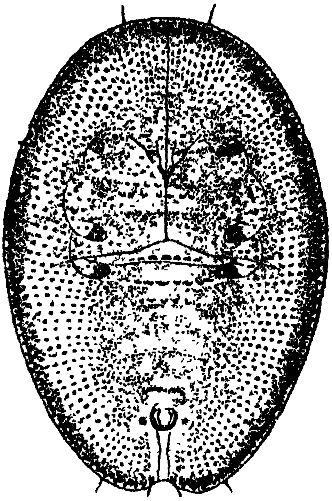

Fig. 94. *Aleurotuberculatus bauhiniæ* sp. n.
Pupa case.

Length 0.80 mm., breadth 0.60 mm.

Host—*Bauhinia bidentata.*

Locality—Johol (Negri Sembilan).

This species is readily distinguished by the linear arrangement of the dorsal papillæ.

Aleurotuberculatus erythrinæ sp. n. (Fig. 95).

Pupa case on leaf, flat, whitish and without secretion. Shape elliptical, broadest across first abdominal segment, narrowing posteriorly and slightly recessed at caudal fold. Margin finely crenulate; just within margin a ring of about four hundred and seventy-four minute papillæ. The area between this ring and subdorsum with larger papillæ more regularly arranged and less numerous in submarginal area than in vicinity of dorsal disc. Thoracic cleft without crenulations or papillæ, slightly depressed and internally with a semicircular area. Submargin not differentiated.

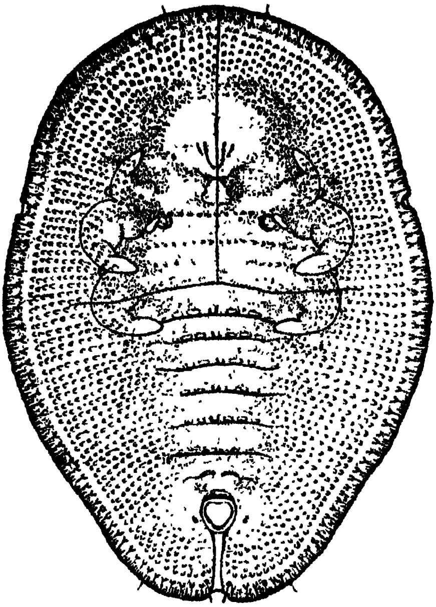

Fig. 95. *Aleurotuberculatus erythrinæ* sp. n.

Pupa case.

Marginal sutures not conspicuous. Thoracic and abdominal sutures and rudimentary legs lined with small irregular shaped tubercles which are slightly larger on the abdominal segments. In addition to these tubercles a few larger ones are present near rudimentary legs. Mid-thoracic suture reaches margin, and transverse suture submarginal area. Caudal fold conspicuous, broad, without markings and terminating in concavity at margin. No conspicuous spines on case. Vasiform orifice subcordate, anterior margin protruding and outer posterior margin not conspicuously recessed, operculum similar in shape, obscuring lingula.

Length 0.59 mm., breadth 0.40 mm.

Host—*Erythrina* sp.

Locality—Kuala Lumpur (Selangor).

This is not a typical species of this genus. It is placed here, however, on account of the ring of minute papillæ just within the margin, of its tracheal clefts and some moderately conspicuous tubercles on cephalo-thorax.

Genus **Taiwanaleyrodes** Takahashi.

"Aleyrodidæ of Formosa, I," Dept. Agric., Japan, Report No. 59, March, 1932.

Taiwanaleyrodes indicus (Singh). (Fig. 96a).

"Aleyrodidæ of Formosa I," Dept. Agric., Japan, Report No. 59, March 1932.

This species originally described from India on *Ficus carica* and *Michelia champaca* undoubtedly belongs to the more recent genus *Taiwanaleyrodes.*

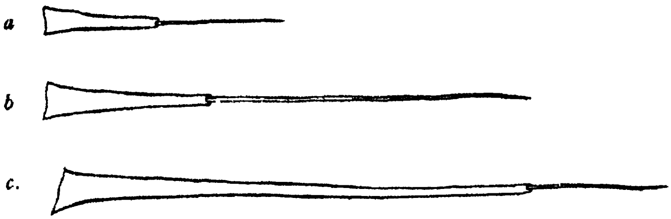

Fig. 96. Comparative lengths of an abdominal spine of:—

a. *Taiwanaleyrodes indicus* (Singh).

b. *T. fici* sp. n., *T. macarangæ* sp. n.

c. *T. baccaureæ* sp. n.

Hosts in Malaya—*Michelia champaca* and *Dillenia indica.*

Locality—Kuala Lumpur (Selangor).

Taiwanaleyrodes fici sp. n. (Figs. 96b, 97).

This species is very similar to *Taiwanaleyrodes indicus* (Singh.), but the distal joint of a spine is about twice as long as the basal one, whilst in *Taiwanaleyrodes indicus* the basal and distal joints are about equal in length.

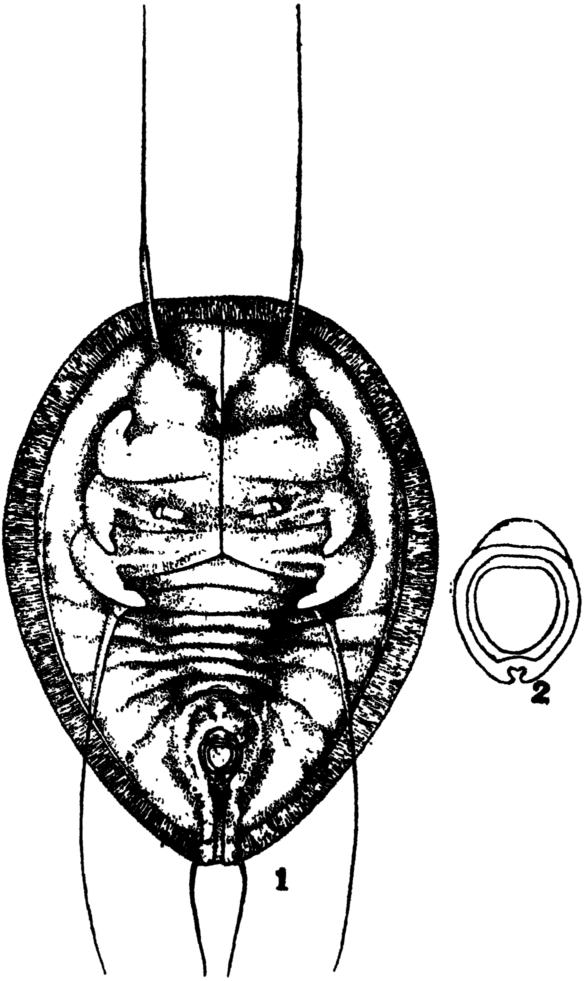

Fig. 97. *Taiwanaleyrodes fici* sp. n.
1. Pupa case.
2. Vasiform orifice.

Hosts—*Ficus* sp. and *Euphorbia pulcherrima.*

Locality—Kuala Lumpur (Selangor).

Taiwanaleyrodes baccaureæ sp. n. (Figs. 96c, 98).

Pupa case raised by a rim from undersurface of leaf, yellowish-white, without secretion. Shape elliptical, narrowing posteriorly. Margin finely toothed with few but distinct striæ in submarginal area. No thoracic pore. No dorsal tubercles. No small granules or small papillæ seen, if present very small. Chitinised ridge runs laterally and anteriorly in cephalo-thorax. Abdominal segments without tubercles and corrugations, its sutures extending well into subdorsal area. Two pairs of jointed spines, one anteriorly in cephalo-thorax and one laterally on basal abdominal segment, basal joint of each very long as compared with distal extremity. Caudal furrow distinct, unspotted, widened towards termination. Vasiform orifice prominent, anterior margin protruding, posterior margin conspicuously recessed and lateral margins thickened. Operculum filling orifice and concealing lingula.

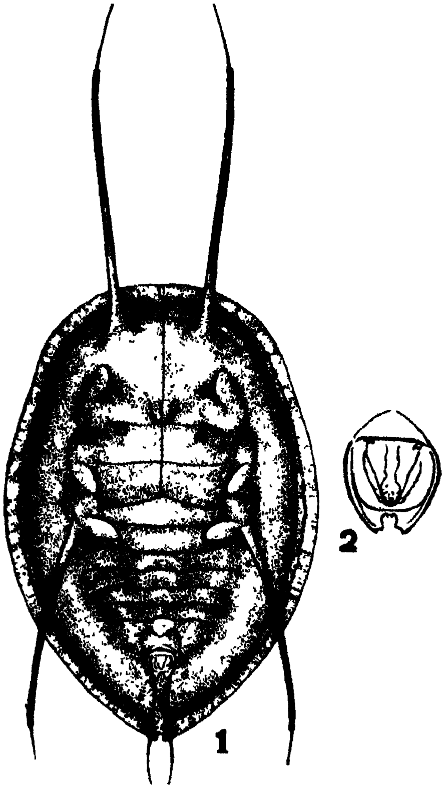

Fig. 98. *Taiwanaleyrodes baccaureæ* sp. n.
1. Pupa case.
2. Vasiform orifice.

Length 0.42 mm., breadth 0.28 mm.

Host—*Baccaurea Motleyana.*

Locality—Pudu (Selangor).

In many respects similar to *Taiwanaleyrodes indicus* Singh and *Taiwanaleyrodes fici* from which, however, *T. baccaureæ* may readily be distinguished by the length of the basal as compared with the distal joint of the two-jointed spines.

Taiwanaleyrodes macarangæ sp. n. (Figs. 96b, 99).

Pupa case raised by a rim from undersurface of leaf, whitish, without dorsal or lateral secretion. Shape obovate, narrowing posteriorly. Margin finely toothed. No thoracic pore. No dorsal tubercles. No small granules or small papillæ seen. Abdominal sutures with prominent chitinised thickenings and extending into subdorsal area. Two pairs of prominent jointed spines, one anteriorly on cephalo-thorax and one on basal abdominal segment, distal joint being about twice as long as basal one. Caudal furrow distinct, about the same breadth through its entire length and armed at its termination by a pair of slender spines. Anteriorly to vasiform orifice is a transverse elliptical porous area. Vasiform orifice with anterior margin protruding, posterior margin conspicuously recessed and with thickened walls. Operculum has the appearance of being constricted, on the other hand it may be recessed with the lingula exposed.

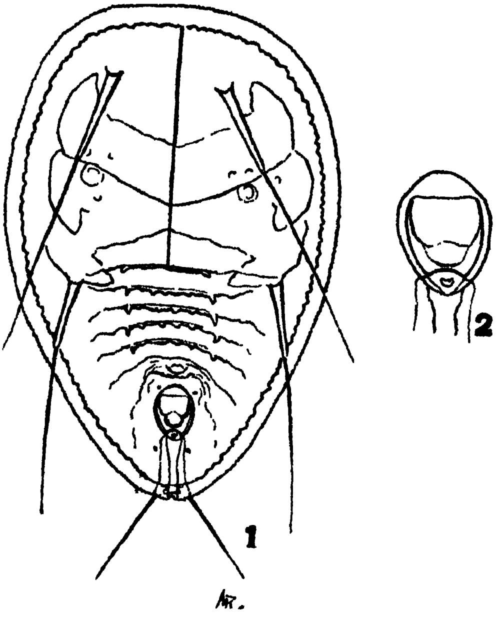

Fig. 99. *Taiwanaleyrodes macarangæ* sp. n.

1. Pupa case.
2. Vasiform orifice.

Length about 0.44 mm., breadth about 0.30 mm.

Host—*Macaranga megalophylla.*

Locality—Sepang (Selangor).

The jointed spines of *T. macarangæ* are about the same length as those of *T. fici* from which it is readily distinguished by the chitinised thickenings on the abdominal sutures.

Genus **Asialeyrodes** gen. n.

Pupa case almost flat, broadly elliptical, marginal band narrow, submarginal area wide, separated by a suture-like line around case. Dorsum without conspicuous pores or papillæ, tracheal and caudal folds distinct. Vasiform orifice small, subcordate, without teeth, operculum similarly shaped and obscuring lingula. Orifice not surrounded by a trilobed area. Genotype *Asialeyrodes lumpurensis* sp. n.

Closely related to *Africaleurodes* Dozier, but differing from it in having the lingula obscured and in having distinct tracheal folds, resembles *Aleurolobus* Q. and B. but has no "eye spots" and also similar to *Dialeurodes* Cockerell but possesses a suture-like line around the case.

Asialeyrodes lumpurensis sp. n. (Fig. 100).

Pupa case flat, on undersurface of leaf, white without conspicuous colouring, no secretion evident. Shape broadly elliptical, slightly emarginate at thoracic and caudal pores.

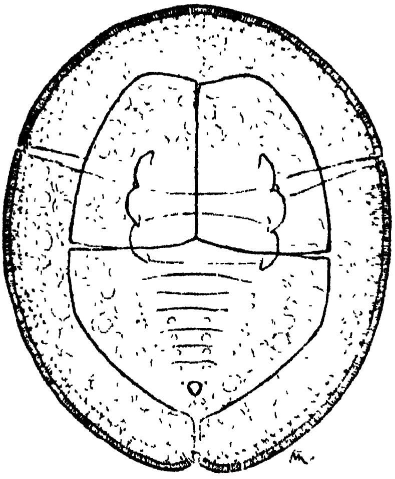

Fig. 100. *Asialeyrodes lumpurensis* gen. et sp. n. Pupa case.

Margin entire, sutures in marginal band evident. Thoracic and transverse sutures meet in mid-dorsal line about 0.04 mm. from anterior margin and terminate at submarginal suture-like line which runs around case at about 0.10 mm. from margin and is slightly depressed at anterior margin. Abdominal segments very faintly indicated, rudimentary legs conspicuous. Thoracic pores small, open at margin and lined with what appear to be very inconspicuous teeth.

Thoracic folds broad and run to region of rudimentary legs. Markings apparently absent, if present dotted and inconspicuous. Caudal pore similar to thoracic pore, caudal fold spotted anteriorly. The case with the exception of thoracic fold is generally completely covered with subcircular markings, but in some specimens not conspicuous on thoracic and abdominal segments. Vasiform orifice small, subcordate, without teeth, operculum similarly shaped filling orifice and obscuring lingula.

Length about 0.80 mm., breadth 0.66 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

This species is similar to *Dialeurodes dorsidemarcata* Singh but the tracheal fold is one of the chief characteristics of *Asialeyrodes lumpurensis.*

Asialeyrodes selangorensis sp. n. (Fig. 101).

Pupa case closely applied to undersurface of leaf, yellowish, without lateral or dorsal secretion. Shape, broadly elliptical. Margin entire, incised by marginal sutures, narrow marginal band. Submarginal area with sutures prominent and with numerous minute spines, a somewhat regular ring is seen near inner margin. Thoracic pore opens at margin and the unmarked fold is conspicuous through submarginal area and probably

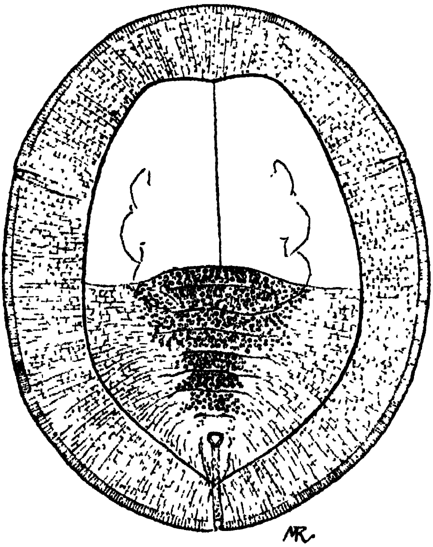

Fig. 101. *Asialeyrodes selangorensis* sp. n. Pupa case.

extends as in *A. lumpurensis* to the rudimentary legs but the specimen is without its cephalo-thorax. Caudal pore similar to tracheal pore and caudal fold is dotted. Posterior half of dorsal disc subdorsally is markedly reticulate, the median and submedian areas of abdominal segments are crowded with irregular shaped clear-looking areas. Vasiform orifice comparatively small, subcordate without teeth, anterior margin slightly depressed, operculum about fills orifice and obscures lingula.

Length 1.12 mm., breadth 0.92 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Genus **Malayaleyrodes** gen. n.

Pupa case flat, subovate to elliptical. Dorsum without pores, minute spines present. Tracheal folds not discernible, the tracheal pores small and rounded on margin. Caudal fold broad and marked to submarginal line but narrowing and unmarked to margin. Caudal pore opens within margin. Thoracic and transverse sutures to submarginal differentiation. Dorsal disc conspicuously defined by tooth-like projections. Vasiform orifice sub-cordate, posteriorly thickened, outer and posterior margin recessed; operculum fills about two-thirds of orifice, slightly recessed posteriorly but lingula is not visible. Genotype *Malayaleyrodes lumpurensis* sp. n.

Closely related to *Africaleurodes*, *Asialeurodes* and *Aleurolobus* in having the central portion differentiated by a suture-like line, but, differing from them in having the dorsal disc defined.

Malayaleyrodes lumpurensis sp. n. (Fig. 102).

Pupa case on leaf, yellowish-brown, no secretion evident. Shape broadly elliptical, slightly depressed near thoracic pores, broadest across basal abdominal segment. Margin entire, sutures distinct in submarginal area but more conspicuous in subdorsal area. Submarginal area about 0.08 mm. wide and about its middle with a ring of minute spines. Similar sized spines through subdorsal area and cephalothorax, also two pairs to each abdominal segment. Tracheal pore subcircular and opens at margin: tracheal fold not discernible. Caudal pore opens just within margin, fold evident with minute somewhat linear markings to submarginal suture where it extends laterally. Transverse and thoracic sutures to submarginal delineation. Dorsal disc rendered evident by about twelve pairs of tooth-like projections in abdomen and by chitinised thickenings in cephalo-thorax. Abdominal sutures, without tubercles, extend to margin of dorsal disc. Vasiform orifice subcordate, inner margins without teeth posterior margin recessed: operculum similar in shape obscuring lingula. No palmate area surrounds vasiform orifice.

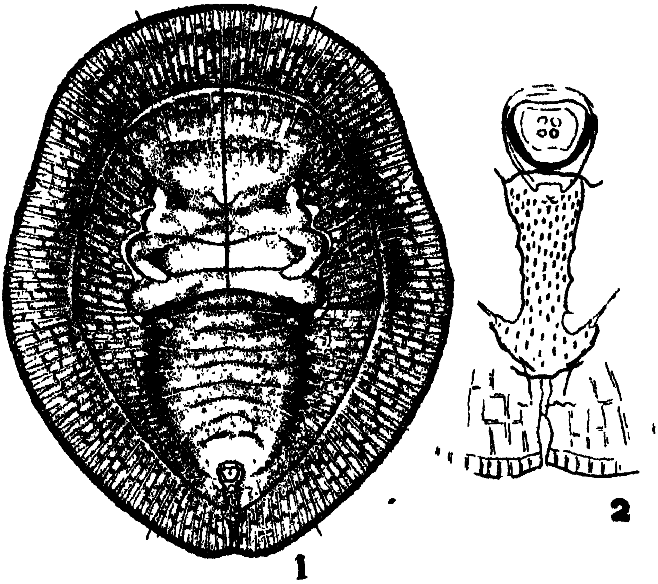

Fig. 102. *Malayaleyrodes lumpurensis* gen. et sp. n.
1. Pupa case.
2. Vasiform orifice.

Length 0.60 mm., breadth 0.5 mm.

Host—*Ficus* sp.

Locality—Kuala Lumpur (Selangor).

Genus **Aleuroporosus** gen. n.

Shape elliptical, without prominent blunt tubercles on the cephalo-thorax. Submarginal area without papillæ and not separated from dorsal disc. Margin entire. Tracheal pores, clefts and folds absent. Caudal furrow distinct. Abdominal segments with tubercle-porous like structures and with an interrupted fold submedially giving them the appearance of a rhachis. Vasiform orifice subcordate, outer posterior margin recessed and inner lateral and posterior margins without teeth. Operculum fills orifice entirely. Genotype *Aleuroporosus lumpurensis* sp. n.

This genus differs essentially from *Aleurotuberculatus* Takah. in the absence of tracheal clefts, from *Taiwanaleyrodes* Takah. in the absence of a marginal rim, from *Aleurocybotus* Q. and B. and *Aleuroputeus* gen. n. (*infra*) in the presence of a caudal fold.

Aleuroporosus lumpurensis sp. n. (Fig. 103).

Pupa case on undersurface of leaf, yellowish, without lateral or dorsal secretion. Shape elliptical, broadest across first abdominal segment, slightly emarginate at termination of caudal fold. Margin entire, slightly incised by sutures which are conspicuous from the margin. Tracheal cleft, pore and fold indiscernible. Caudal fold narrow, at its termination broadening and with a prominent tooth. The whole derm is crowded with very minute dots. Transverse suture extends to just beyond third pair of rudimentary legs and mid-thoracic almost to margin. No subdorsal tubercles on the abdomen or on cephalo-thorax but interrupted chitinised folds are present externally to thoracic legs. Sub-medially on the abdomen a fold is present giving to the segments a somewhat rhachis appearance, the abdominal sutures extend beyond these folds. Mid-dorsally on the first to the fifth abdominal segments is a pair of prominent porous-tubercle like structures and on the sixth three smaller but similar tubercles. Three pairs of long spines arm the case, two pairs being situated on the cephalo-thorax and one pair on basal abdominal segment. Vasiform orifice subcordate, slightly rounded anteriorly recessed posteriorly and without teeth from inner lateral margins. Operculum entirely fills orifice obscuring lingula.

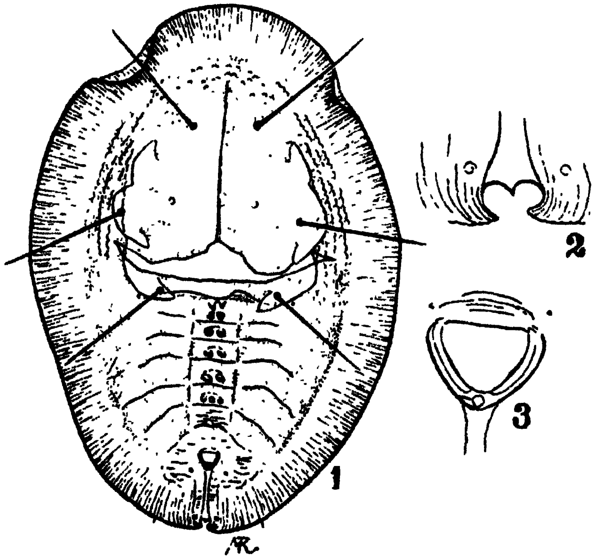

Fig. 103. *Aleuroporosus lumpurensis* gen. et sp. n.
1. Pupa case.
2. Caudal opening.
3. Vasiform orifice.

Length 0.68 mm., breadth 0.48 mm.

Host—Unidentified.

Locality—Kuala Lumpur (Selangor).

Genus **Aleuroputeus** gen. n.

Pupa case. Elliptical to subovate, margin toothed. Tracheal, caudal folds, and pores absent. A ring of submarginal spines. Dorsal disc defined by a chitinised fold. Conspicuous pores on median line of anterior abdominal segments. Abdominal segments submedially with toothlike processes. Vasiform orifice cordate to subcordate. Operculum recessed posteriorly and about half-filling vasiform orifice. Lingula exposed, included and knobbed. Genotype *Aleuroputeus perseæ* sp. n.

The characters of this genus differ essentially from *Aleurocybotus* in its possession of submarginal spines and in the presence of a chitinised fold differentiating the dorsal disc.

Aleuroputeus perseæ sp. n. (Fig. 104).

Pupa case on undersurface of leaf, not crowded, yellowish without dorsal or marginal secretion. Shape subovate, flattened anteriorly, slightly constricted across first thoracic segment. Margin toothed. No tracheal or caudal pores or folds. Transverse suture not reaching margin. Midthoracic to margin. A submarginal ring of eleven pairs of spines, extending slightly beyond the margin, the posterior pair slightly longer. Marginal sutures fairly prominent terminating at margin of dorsal disc, which is defined posteriorly by an interrupted chitinised fold and

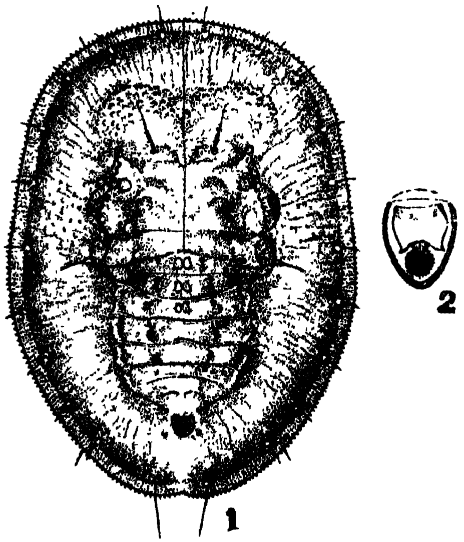

Fig. 104. *Aleuroputeus perseæ* gen. et sp. n.

1. Pupa case.
2. Vasiform orifice.

anteriorly in cephalo-thorax by small rounded tubercles. The abdominal segments with a rhachis appearance; each abdominal segment armed submedially with two pairs of small pointed tubercles. Abdominal sutures moderately evident to chitinised fold. On median line of first three abdominal segments, a pair of conspicuous porous looking structures. A large tubercle near each prothoracic leg is evident. A small pair of moderately long spines near mouth parts and also latero-anteriorly to vasiform orifice are present. Vasiform orifice subcordate; operculum fills about two-thirds of orifice and is posteriorly recessed. Lingula exposed, included and knobbed.

Length 0.83 mm., breadth 0.57 mm.

Host—*Persea gratissima.*

Locality—Kuala Lumpur (Selangor).

Aleuroputeus baccaureæ sp. n. (Fig. 105).

Pupa case appearance on leaf not known. Shape elliptical, narrowing posteriorly. Margin toothed. Without tracheal, caudal pores, and folds. Just within margin, a ring of eleven pairs of small but prominent spines, the tips of which about reaching margin. Marginal sutures moderately distinct. Dorsal disc demarked by a chitinised fold and in addition in the cephalo-thorax by small tubercles.

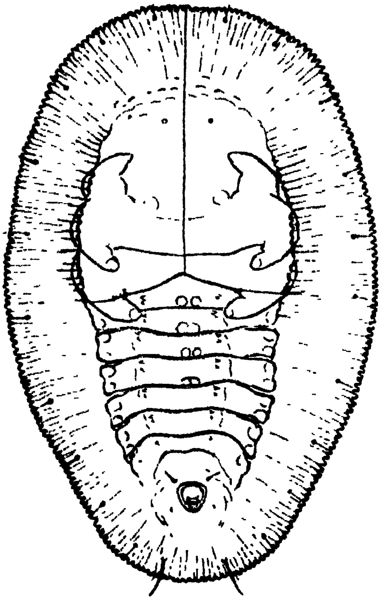

Fig. 105. *Aleuroputeus baccaureæ* sp. n.
Pupa case.

The abdominal segments mid-dorsally with a rhachis appearance and on each abdominal segment submedially a pair of tooth-like processes is situated. A blunt tubercle near each first thoracic leg is prominent. On first four abdominal segments in median line a pair of subcircular porous areas. Thoracic suture reaches margin, transverse suture to third pair of rudimentary legs. A pair of spines is situated near mouthparts (only bases seen in specimen) and a pair latero-anteriorly to vasiform orifice. Vasiform orifice subcordate, operculum recessed posteriorly; lingula exposed, included and knobbed.

Length 0.70 mm., breadth 0.44 mm.

Host—*Baccaurea Motleyana.*

Locality—Kuala Pilah (Negri Sembilan).

This species is described from one specimen and was found among other Aleurodid material from *Baccaurea Motleyana.* It is very similar to *Aleuroputeus perseæ* differing essential in its shape and in its possession of four pairs of pores on the first four abdominal segments.

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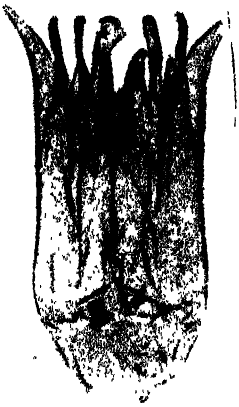

Fig. 2 *Trogaspidia pendleburyi* sp n Genitalia, paratype ♂ (No 1180) p 423

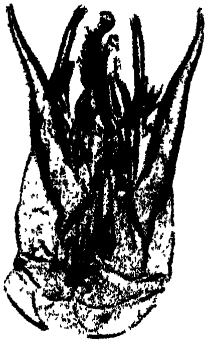

Fig. 11 *Trogaspidia kruanae* sp n Genitalia, ♂. (No 1939) p 438

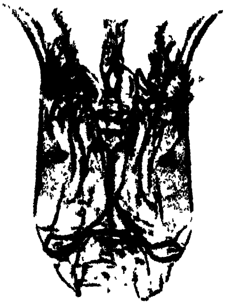

Fig. 13 *Smicromyrme kellyi* sp n Genitalia, with genital tube extruded p 442

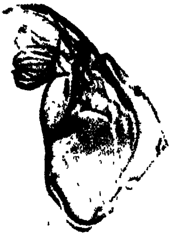

Fig. 14 *Smicromyrme kellyi* sp n External view of right squama p 442

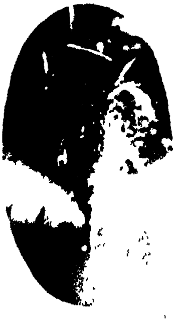

Fig. 5A. *Trogaspidia oryzae*, ♂ paratype. p.429.

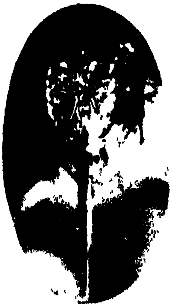

Fig. 12A *Smicromyrme kellyi* ♂ paratype p 442.

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